STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

STAFF SUMMARY REPORT (Leslie Ferguson)
MEETING DATE: May 10, 2017

ITEM: **7A**

SUBJECT: **Why the City of Napa Did Not Flood in 2017; How an Environmentally-Designed Flood Control Project Worked —** Information Item

CHRONOLOGY: September 1999 – Waste Discharge Requirements adopted
2001 – 2004 - Site Cleanup Requirements adopted and amended
March 2011- Project Update as Information Item presented

DISCUSSION: This is an informational item about how a significant flood control project in our region – the Napa River/Napa Creek Flood Protection Project (Project) - performed during 2016-17: exactly as intended! The wet season of 2016-17 was one of the wettest years on record in many areas of California, and flooding was common around the State. Yet, despite having experienced 27 major floods in the past 120 years, and 4 major floods since 1990, the City of Napa did not flood in 2016-17.

The Project is one in which the Water Board was key in ensuring it provided the desired flood protection to a flood-prone area while protecting and restoring wetlands and the river ecosystem. Early flood protection project designs in 1976 and 1987 were rejected by the community after Congress authorized a Napa River project in 1965. After the Board's and the community's rejection again of the Army Corps' project designs in its 1995 Flood Management Plan, the Project was developed through a two-year community-wide coalition process, coordinated by the Napa County Flood Control and Water Conservation District (District). The Community Coalition was a cooperative process among a broad group of stakeholders consisting of residents, businesses, political and community leaders, and environmental agencies, which resulted in a "Living River" design that received over two-thirds of the votes in a county-wide 1998 sales tax election. The Living River design is a multi-benefit flood management approach that seeks to combine flood protection with wetland restoration and reconnection of the Napa River to its historic floodplain. The Board subsequently adopted Waste Discharge Requirements for the Project in 1999 that incorporated the Living Review design.

Starting in 1996, Board staff Leslie Ferguson co-chaired the development of the guidelines for the Project's Living River concept, which remains the guiding document for project implementation to this day. Leslie continues to oversee implementation of the Project.

This item will include a presentation from Leslie on the history and design of the Project and a presentation from Rick Thomasser of the District. Mr. Thomasser will be sharing how the Project performed successfully during this year's storms, preventing the City of Napa from flooding. The Project is rightfully receiving broad publicity as demonstrated by County Supervisor Diane Dillon's article (Appendix B) and an April 30 article in the San Francisco Chronicle (http://www.sfchronicle.com/politics/article/Living-river-rejuvenates-Napa-brings-11109403.php?cmpid=email-premium).

We have developed a Fact Sheet that describes the project in more detail (Appendix A), which we intend to post on our website. We welcome suggestions on its improvement.

RECOMMEN-DATION: This item is for information only and no action is required.

APPENDICES: A. Napa River Flood Protection Project Fact Sheet
B. County Supervisor Dillon's Article on Project

Item 7 - Appendix A

Project Fact Sheet

THIS PAGE INTENTIONALLY LEFT BLANK

NAPA RIVER FLOOD PROTECTION PROJECT

Fact Sheet

The Project as of May 2017

The wet season of 2016-17 was one of the wettest years on record in many areas of California, and flooding was common around the State. The City of Napa experienced its seventh wettest year since rainfall recording began in 1893, and average rainfall was 167% of mean annual precipitation in the Napa Valley. Yet, despite having experienced 27 major floods in the past 120 years, and 4 major floods since 1990, the City of Napa did not flood in 2016-17.

That Napa did not flood in 2016-17 was due to the Napa River/Napa Creek Flood Protection Project (Project) functioning as designed. The Project extends 6.9 miles through downtown Napa and is being jointly implemented by the Napa County Flood Control and Water Conservation District (District) and the U.S. Army Corps of Engineers (Corps). While the Project, designed to provide 100-year flood protection, is not yet complete, a large number of its elements have been implemented, and these functioned successfully in 2016-17 to protect the City from flooding.

Pre-Project Napa City flooding.

Project Background

Flooding in Napa is caused by both the Napa River (River) and its tributary, Napa Creek (Creek), which join together in downtown Napa. Due to the extensive history of flooding, Congress authorized a Napa River Flood Protection Project in the federal Flood Control Act of 1965. Twice in the 1970s, the Corps developed project designs; both were rejected by Napa County voters for financial and environmental reasons. After the 1986 Napa flood caused losses exceeding $100 million, evacuation of 5,000 people, and 3 deaths, Napa County petitioned the Corps to re-initiate a project. However, the resulting 1995 Flood Management Plan was similar to previous plans and was rejected by both the community and the Water Board.

Environmental and design issues with the 1995 plan included: it would have created a geomorphically-unstable deepened and widened trapezoidal river channel with levees and floodwalls on top of river banks; bridges would have remained in existing configurations and heights; excessive rip-rap to stabilize banks would be employed, limiting vegetation growth and habitat; extensive soil and groundwater contamination would be left in place immediately adjacent to the River; and the planned use of year round “wet bypasses” intended to function as secondary channels would lead to reduced flows in the main river channel and water quality impacts including decreased dissolved oxygen, siltation, eutrophication, and changes in the salinity and tidal regime of the upper end of the Napa River estuary. The increase in River channel width and depth would have decreased sediment transport and would have resulted in increased sediment deposition and the need for ongoing dredging to maintain flood conveyance.

The Water Board and other State and federal resource agencies weighed in heavily against the design in the 1995 plan during the draft EIR and initial permitting phase.

Napa River Community Coalition

While historic development of downtown Napa had significantly degraded the River by 1995, habitat for steelhead and chinook salmon was still present. The community viewed a flood control project through downtown Napa as an opportunity to restore the River's ecosystem and integrate it as an urban amenity revitalizing the City's economy and recreational opportunities.

The combination of local citizen and agency opposition to the 1995 plan led the District to recognize it needed a different approach to the then-typical flood control design to create an environmentally-sensitive design that also met wide-ranging community needs. Therefore, it formed a Community Coalition that engaged in a two year cooperative design process. This included broad stakeholder participation of 27 local stakeholder groups and 24 agencies including: residents, businesses, political and community leaders, and environmental agencies with diverse interests in flood protection. It was a "working" coalition of workgroups (financial, environmental, architectural, and education and outreach) charged with producing tangible outputs such as the financial and environmental plans for the project. This collaborative process was likely the most significant factor that led to the creation of a successful and environmentally-sensitive Project that has integrated the City with the River, rather than walling it off.

Key goals of the Community Coalition included: 100-year flood protection for Napa; a "living river" design that would provide environmental and recreational opportunities; and broad-based community participation. Water Board staff were invited to participate in the Community Coalition and served as co-chair of the Geomorphic, Water Quality, and Habitat Workgroup ("Living River" Workgroup) that created the "Living River Guidelines." These Guidelines have served as the environmental blueprint for the resultant Project, both in the initial and on-going final design stages and on-going maintenance.

In 1997, the Project received the required 2/3 county-wide vote to fund the Project's local cost share. The Water Board approved Waste Discharge Requirements in 1999 for the Project's general design and, in subsequent orders, approved cleanup of petroleum-contaminated sites within the Project's footprint. Cleanup of these sites resulted in the removal of over a quarter-million cubic yards of contaminated soil.

Due to the robust Community Coalition process, and throughout the construction process, citizens and local officials of Napa have continued to support the Project despite its significant temporary but disruptive construction impacts.

Environmentally-Sensitive Flood Control: The Napa River Project's Elements

The Project's environmentally-beneficial elements include a dynamic but relatively stable Napa River geomorphic channel that maintains sediment transport and incorporates estuarine features such as wetlands, mudflats, marshplains, and floodplains to manage flood flows. This was achieved through land acquisition; removal and/or setback of existing levees; overbank excavation of 3.5 miles of the River; replacement or relocation of six bridges with higher, longer spans; and cleanup of toxic sites along 1 mile of River. The Project has created over 600 acres of wetlands and mudflats and 400 acres of oak and grassland

floodplain habitat. A vegetated land-water interface is maintained through biotechnical bank stabilization. Additionally, a high-flow bypass (the Oxbow Bypass), which only functions during extreme storm flows, provides flood conveyance while maintaining flow and water quality in the River at other times. The Oxbow Bypass functioned for the first time in January 2017 and worked perfectly!

Oxbow Bypass functioning to prevent flooding.

Napa Creek Flood Control in a Highly Urbanized Interior

The Project's floodplain elements for the River incorporated opportunities for relatively large areas of land acquisition and multi-use recreation. The Creek, however, runs through the densely developed residential and commercial downtown and was a much more highly-constrained urban corridor. To address this, the Project utilized opportunities provided by alleys, streets, bridges, and parking lots to place stormflow bypasses (dry bypasses) underground and to re-direct traffic flow where needed. Additionally, in a reach of the Creek where no other options existed, seven homes were purchased and demolished, parking lot size reduced, and a floodplain created. Throughout the Creek, biotechnical bank stabilization methods were used to stabilize the banks, enhancing the previously degraded habitat value for migrating and rearing steelhead. The habitat at the land-water interface is one of the most critically important habitats for steelhead providing high velocity refuge, cover from predators, shade, and food.

Next Steps and Summary

The Project has already achieved many of the Community Coalition's goals; however, further work is needed to achieve 100 year flood protection**.** Before this year, the last flood occurred in 2005 when the Project was only 40% complete. Until the Project is complete, it could still flood in very large events. At this time, federal funding of the Project's remaining elements is not secured due to changes in the Corps' cost-benefit calculations. The remaining elements include setback floodwalls upstream of downtown and in the oxbow and in a short reach immediately downstream.

The goal of turning the Napa River into a "Living River" that provides both high quality habitat and recreation opportunities and flood protection is being realized. Over 31 bird and 22 fish species reside in the wetland/open water habitat that has been opened to the River, and steelhead and chinook habitat throughout the Project has been improved. Beaver now reside in the Creek downtown. Over 3.5 miles of recreation trails have been created and the downtown area incorporates urban amenities into flood protection features. These include: a river front promenade with an amphitheater and an open dry bypass (Oxbow Bypass) that serves as a city park with public trails, space for events, and an amphitheater. All of these urban features are designed to flood and provide flood protection. The Project has been credited with providing the desired economic boom to Napa, resulting in over $1.5 billion in investment since 1998.

Project prevents flooding during 2017 high flows.

Item 7 - Appendix B

County Supervisor Article

THIS PAGE INTENTIONALLY LEFT BLANK

CALIFORNIA STATE ASSOCIATION OF COUNTIES

THE COUNTY VOICE

Napa County Flood Control 2017

MARCH 8, 2017 | DIANE DILLON

The Napa River Oxbow (foreground) and the Oxbow Bypass (middle right) during high flows of February 2, 2017. During a 100-year event the Bypass will divert 50% of the river's flow around the oxbow to prevent flooding.

Several years ago, a swollen Napa River meant sandbags and road closures for anxious home and business owners concerned about flood waters spilling over into their lives.

With this winter's watery assault on Northern California preceded by years of drought, the Napa Creek/Napa River Flood Control Project had the opportunity to demonstrate its value. Napa County is about two thirds of the way through the multi-year, multi-project flood control program – and it has already reduced the threat of flooding in the City of Napa and become a nationally recognized collaborative model for approaching multi-agency, multi-purpose public works projects.

The Napa River is one of the last undammed rivers in California, running through some of the most valuable and well known agricultural land in the state. The river winds its way past world-class vineyards and wineries from Calistoga to St. Helena to Yountville and through Napa on its way to San Pablo Bay.

Significant flooding every 5-10 years has been a problem for decades. All the local governments, as well as the environmental community, grape growers, wineries, downtown businesses and affected residents had opinions about how to handle flood control. And so did the Army Corps of Engineers, the federal agency authorized in 1965 to lead the effort. What everyone knew was that, to be successful, any work involving the Napa River had to be a collective effort — and it would need funding from federal, state and local sources.

How to raise the local share of the money? And how to reduce flood risks without resorting to concrete and rock-lined levees? That's how the Army Corps of Engineers typically deals with flood control projects. But the people of Napa wanted to reduce flooding and enhance the habitat for fish, birds—and people—at the same time. They wanted a new and better way.

So they created the Living River concept. They would use logs and living trees –not just concrete floodwalls—to support river banks. They would improve a "bypass" area that is only wet during high river flows. The rest of year, it would be a park with hiking and biking trails. From the Napa River's north county origin to the wetlands in the south, they would make the river less prone to flooding and enhance the habitat, too. And they would put a half-cent sales tax increase, Measure A, on the ballot in 1998 to provide the local funding for 20 years.

A tall order – but they did it, and now they are seeing the benefits in the City of Napa and throughout the valley floor. With nearly $400 million worth of bridge relocations, flood plain terracing, channel widening, natural bank stabilizations, and floodwalls completed, the Napa Creek and Oxbow Bypass elements are fully functional.

Downtown Napa has been removed from FEMA flood plain mapping – spurring a redevelopment renaissance. Once avoided in favor of trendy up valley destinations, the downtown has experienced private investment exceeding $1 billion in hotels, shops, restaurants, and, of course, tasting rooms. A true success story – and one of which Napa County and all its residents are very proud.