

ATTACHMENT 3. WORK PLAN

The Fresno Metropolitan Flood Control District (“FMFCD”) is pleased to submit this application to the Department of Water Resources for a grant to fund the proposed ***Dry Creek Flood Control Improvement Project*** (hereinafter referred to as “Project”) under the Disaster Preparedness and Flood Prevention Bond Act of 2006. This application follows the applicable sections for Proposition 1E that is outlined in the Proposition 84 and Proposition 1E Guidelines dated November 2012 and the requirements in the Proposition 1E Proposal Solicitation Package dated November 2012.

Included is detailed information regarding the project improvements prior to providing the task list. Please go to page 3-20 to review the task list.

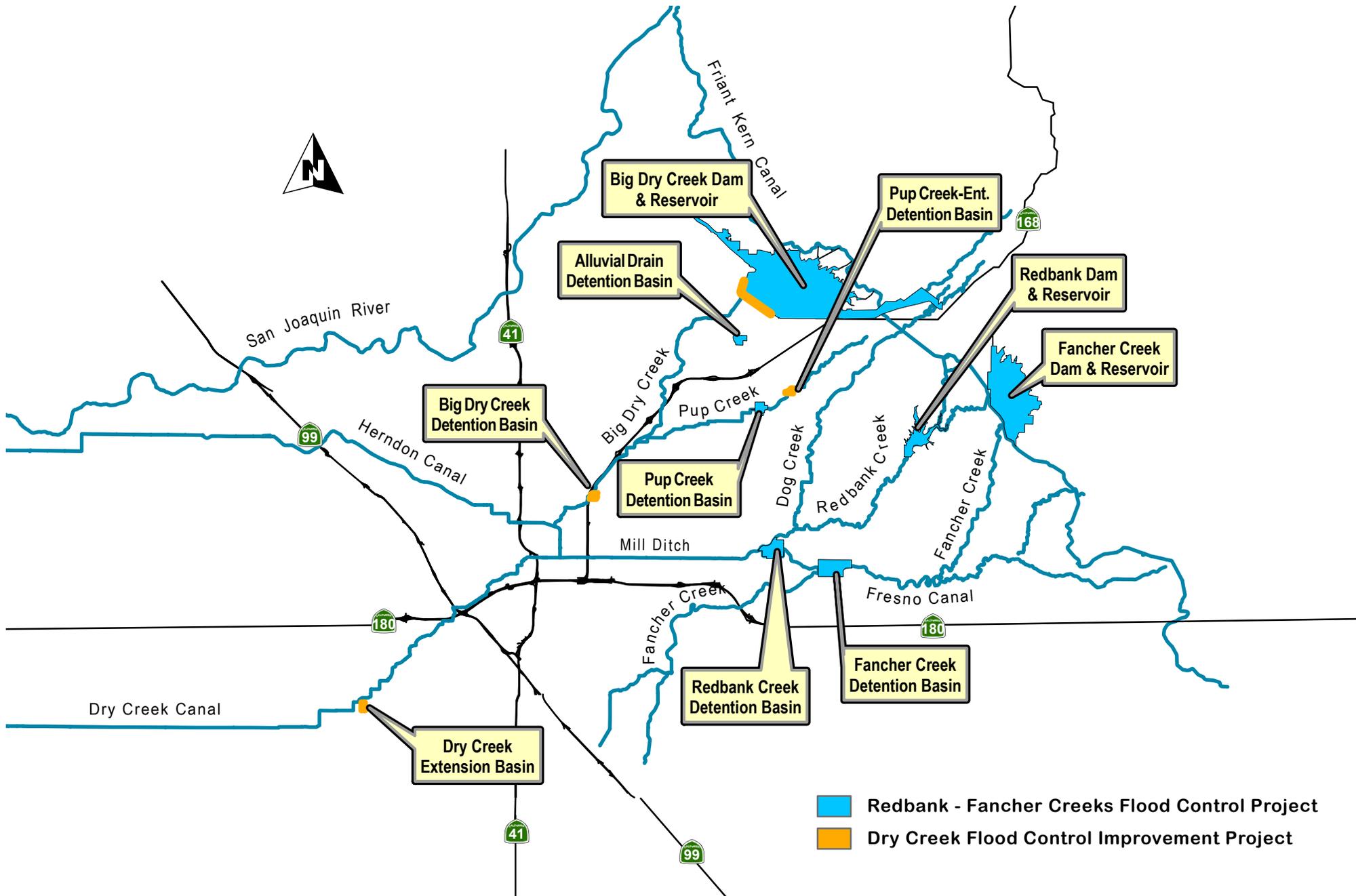
General

The City of Fresno originally developed in the late 1800’s in a natural low-lying area where Dry Creek emptied into the valley floor. The area was called the “Sinks of Dry Creek.” As the City grew, its susceptibility to flood damages also grew. For many years the City addressed flooding conditions with site specific and limited solutions in lieu of a comprehensive plan.

As this approach to drainage and flooding became more and more problematic, in 1956 the local citizenry voted to create a special district to address drainage and flood control solutions. The Fresno Metropolitan Flood Control District became authorized under the provisions of Chapter 73 in the Appendix to the California Water Code. Since its formation, the FMFCD has developed and implemented a flood control and storm drainage master plan, which calls for the systematic completion of an area-wide flood control system of dams, reservoir, and detention basins and numerous local urban drainage systems with stormwater management basins. However, currently the FMFCD must address two significant flood risks: 1) the potential failure of Big Dry Creek Dam as a consequence of insufficient seepage control beneath the dam, and 2) the need for more storage to protect the urban area from excess flood waters and consequential damages. Each of these needs is essential for reduction of flood damages and necessary to improve public safety. For a more detailed background and history, please reference Appendix 3-1.

Proposal

The Dry Creek Flood Control Improvement Project includes improvement of the seepage control at Big Dry Creek Dam and creation of additional flood storage of 1,057 acre-feet (1,077 acre-feet with 20 acre-feet from percolation) distributed at three basin sites along Dry Creek or tributary to Dry Creek. One site will create 50 acre-feet of storage with the grant Project, but be further improved with an additional 150 acre-feet of storage by the FMFCD outside of grant consideration in future years in a method to minimize public expense. For orientation to the Project features with the FMFCD flood control system and major flood channel, please see Figure 3-1. Figures 3-2, 3-3, 3-4, and 3-5 are orientation diagrams for each Project feature with improvements included in the grant Project shown.



Overview of FMFCD's Existing Facilities and Dry Creek Flood Control Improvement Project

Figure 3-1



LEGEND

- ⊗ Proposed Pump Station and Telemetry
- - - - - New Toe Drain

BIG DRY CREEK DAM IMPROVEMENT
Figure 3-2

LEGEND

- - - - - EXISTING CANAL/STREAM
- — — — — EXISTING PIPE

GRANT IMPROVEMENTS

- CALENDAR YEAR 2015
- BERM
 - WEIR
 - FENCE
 - 48,400 CY EXCAVATION
 - SMALL BERM WITH DOWN DRAIN

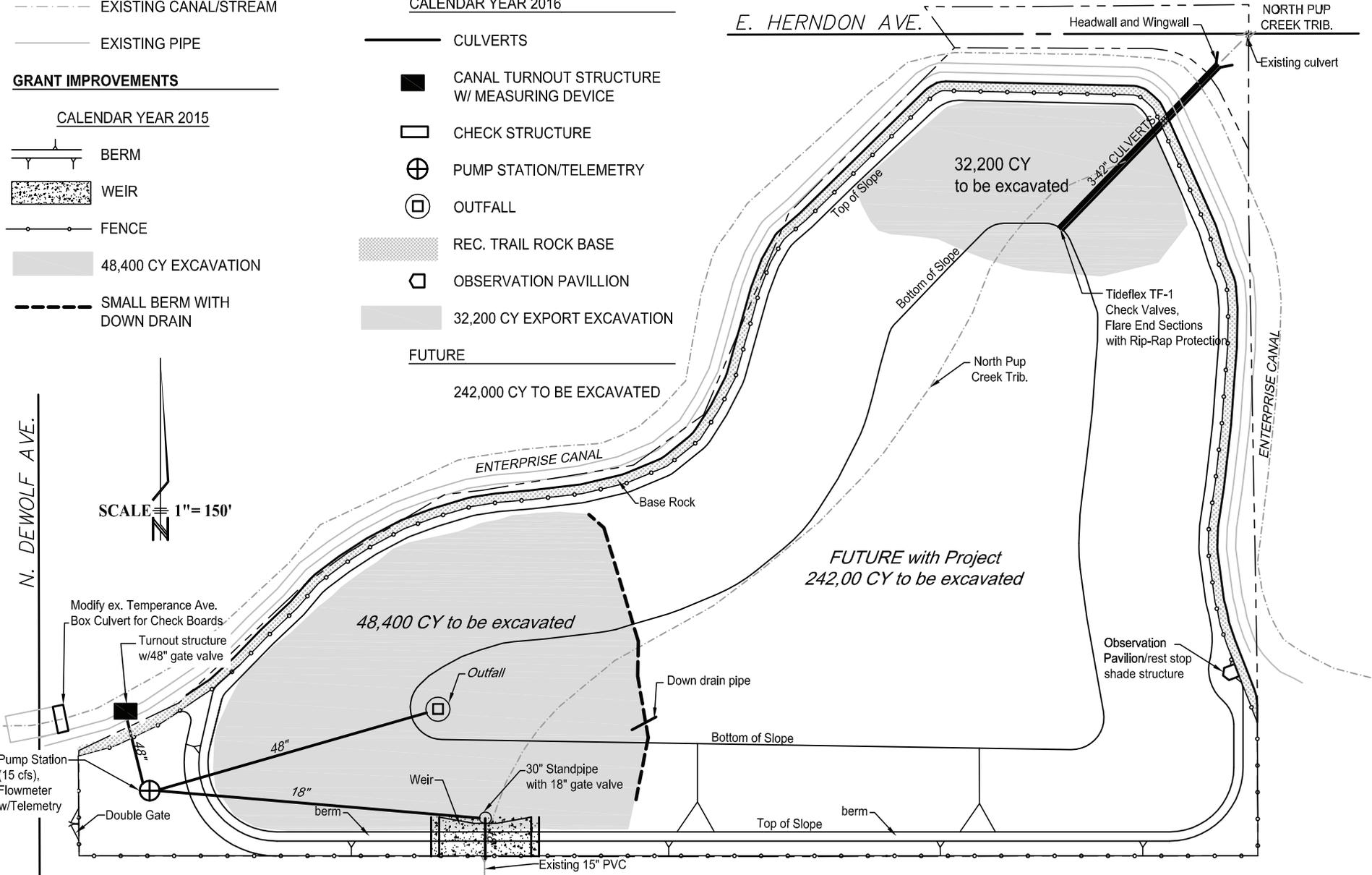
CALENDAR YEAR 2016

- CULVERTS
- CANAL TURNOUT STRUCTURE W/ MEASURING DEVICE
- CHECK STRUCTURE
- PUMP STATION/TELEMETRY
- OUTFALL
- REC. TRAIL ROCK BASE
- OBSERVATION PAVILLION
- 32,200 CY EXPORT EXCAVATION

FUTURE

242,000 CY TO BE EXCAVATED

NOTE:
THIS DRAWING IS SCHEMATIC,
DISTANCES ARE APPROXIMATE.



SCALE = 1" = 150'

PUP CREEK-ENTERPRISE DETENTION BASIN IMPROVEMENT

FIGURE 3-3

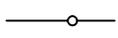
FRESNO METROPOLITAN FLOOD CONTROL DISTRICT

LEGEND

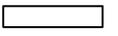
- - - - EXISTING PIPE
- X— EXISTING FENCE

GRANT IMPROVEMENTS

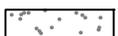
CALENDAR YEAR 2014

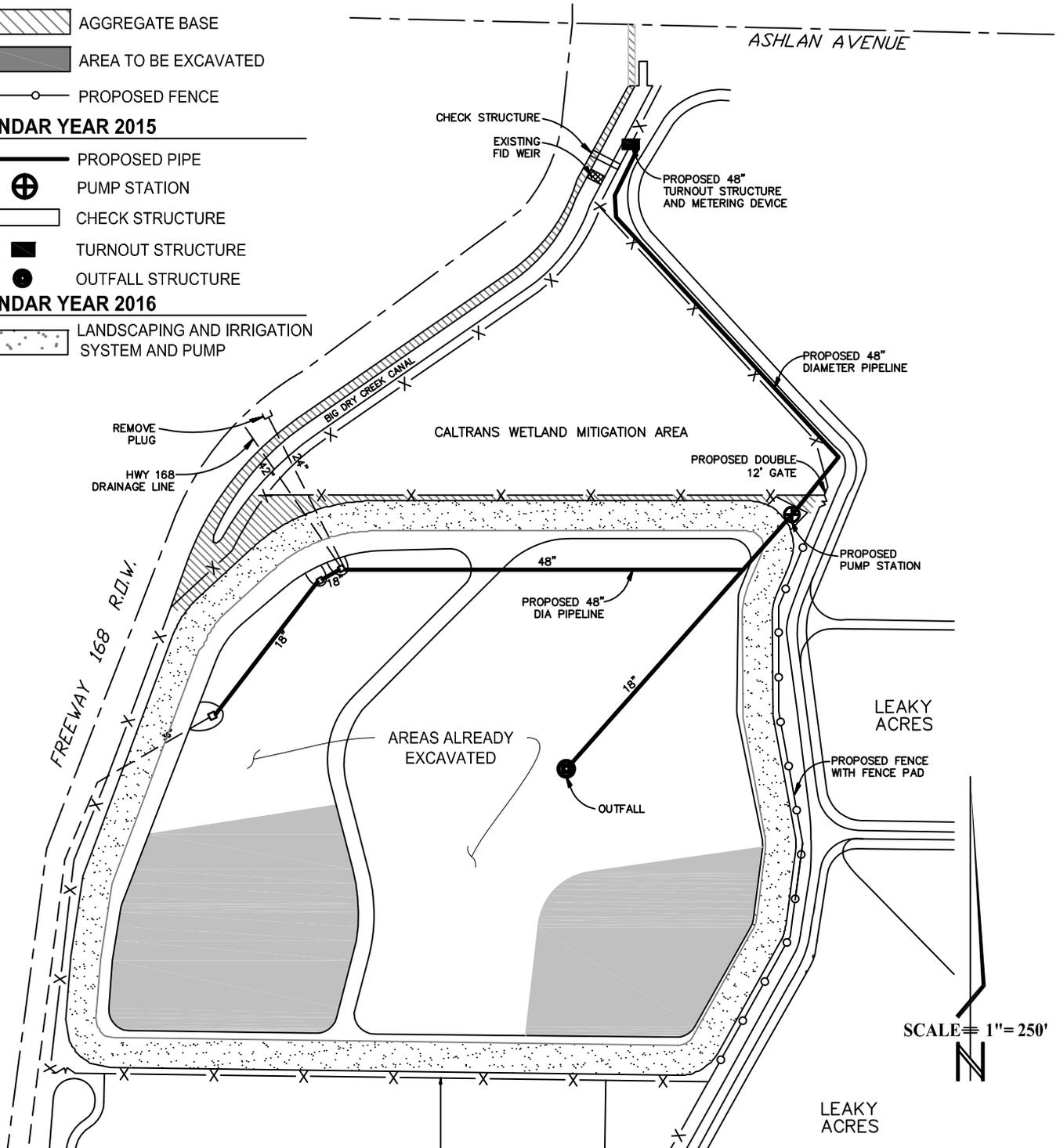
-  AGGREGATE BASE
-  AREA TO BE EXCAVATED
-  PROPOSED FENCE

CALENDAR YEAR 2015

-  PROPOSED PIPE
-  PUMP STATION
-  CHECK STRUCTURE
-  TURNOUT STRUCTURE
-  OUTFALL STRUCTURE

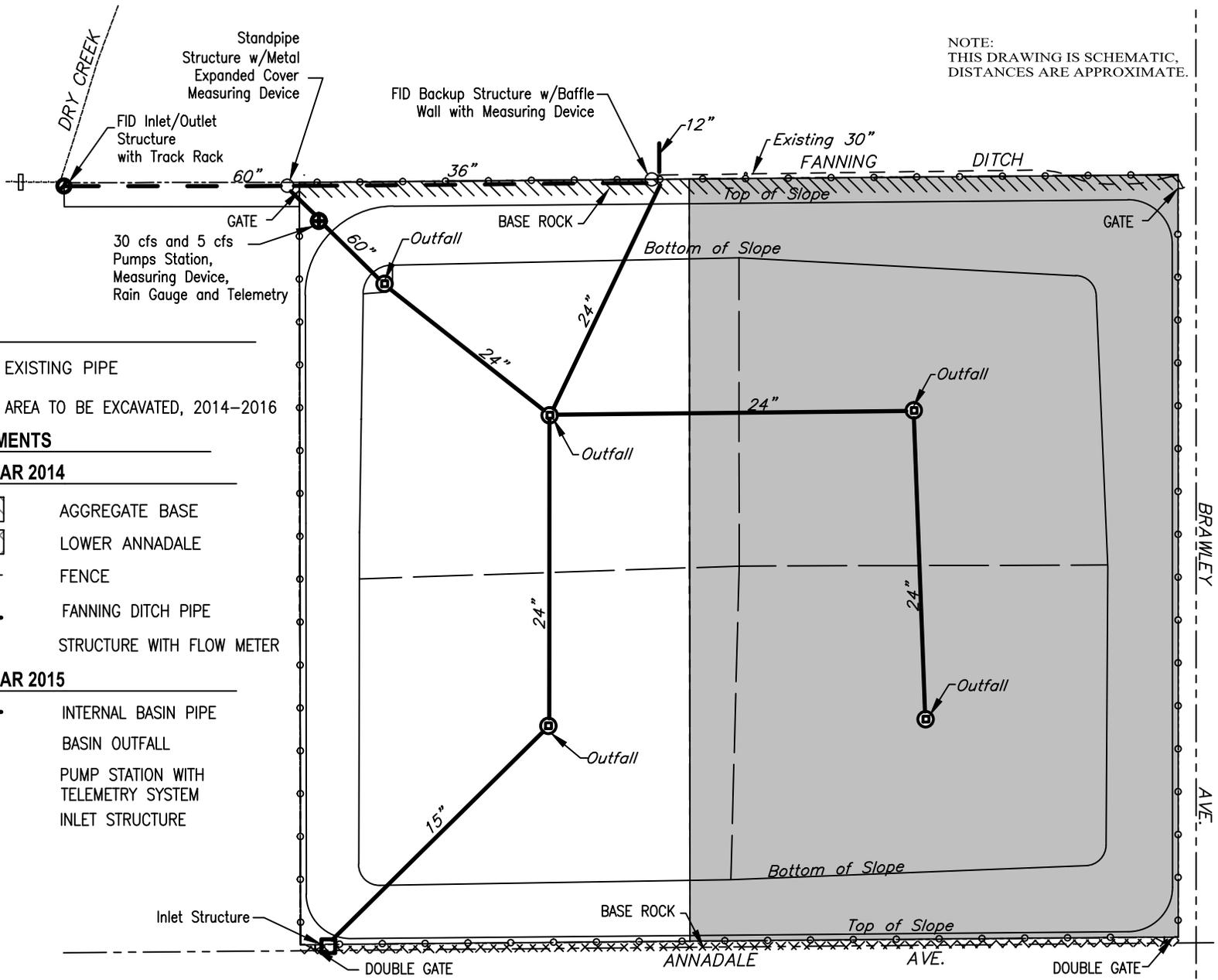
CALENDAR YEAR 2016

-  LANDSCAPING AND IRRIGATION SYSTEM AND PUMP



BIG DRY CREEK DETENTION BASIN IMPROVEMENT

FIGURE 3-4



NOTE:
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LEGEND

- EXISTING PIPE
- ▒ AREA TO BE EXCAVATED, 2014-2016

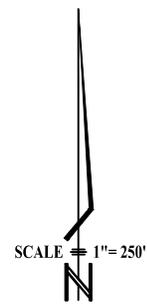
GRANT IMPROVEMENTS

CALENDAR YEAR 2014

- ▨ AGGREGATE BASE
- ▩ LOWER ANNADALE
- FENCE
- - - FANNING DITCH PIPE
- ⊙ STRUCTURE WITH FLOW METER

CALENDAR YEAR 2015

- INTERNAL BASIN PIPE
- ⊕ BASIN OUTFALL
- ⊕ PUMP STATION WITH TELEMETRY SYSTEM
- INLET STRUCTURE



DRY CREEK EXTENSION DETENTION BASIN IMPROVEMENT

FIGURE 3-5

The Project has multiple benefits beyond the primary safety and storage objectives. In addition to the reduction of flood risk, reduction of flood damages, and improved public health and safety, the Project provides public education and outreach, improves habitat and wildlife areas, increases groundwater recharge, and improves water quality.

The FMFCD has acquired or committed to acquiring all of the land necessary to implement the Project. Figures 3-6, 3-7, and 3-8 show the land acquisitions included in the grant Project.

Land Acquisitions included in Project

<u>Location</u>	<u>Acreage</u>	<u>Status</u>
Big Dry Creek Dam	0 acres ¹	N/A
Pup Creek-Enterprise Detention Basin	17 acres	Completed
Big Dry Creek Detention Basin	13.8 acres	Negotiated but not completed ²
Dry Creek Extension Basin	20 acres	Completed
Dry Creek Extension Basin Expansion	23 acres	Willing Seller, but not completed ³

¹Shown as 0 acres as land was acquired prior to September 30, 2008 (Grant ineligible)

²Pending but nearing final Federal Aviation Approval

³Pending Grant funding approval

Storage Improvement in Project

<u>Location</u>	<u>Storage in Acre-Feet</u>	<u>Calendar Year</u>
Big Dry Creek Dam	0	N/A
Pup Creek-Enterprise Basin	50 ¹	2014 to 2016
Big Dry Creek Detention Basin	174.5 ²	2015
Big Dry Creek Detention Basin	37.2 ³	2014 to 2016
Dry Creek Extension Basin	309	2015
Dry Creek Extension Basin Expansion	486	2013 to 2016

¹150 acre-feet will be added after the grant Project is complete solely by FMFCD

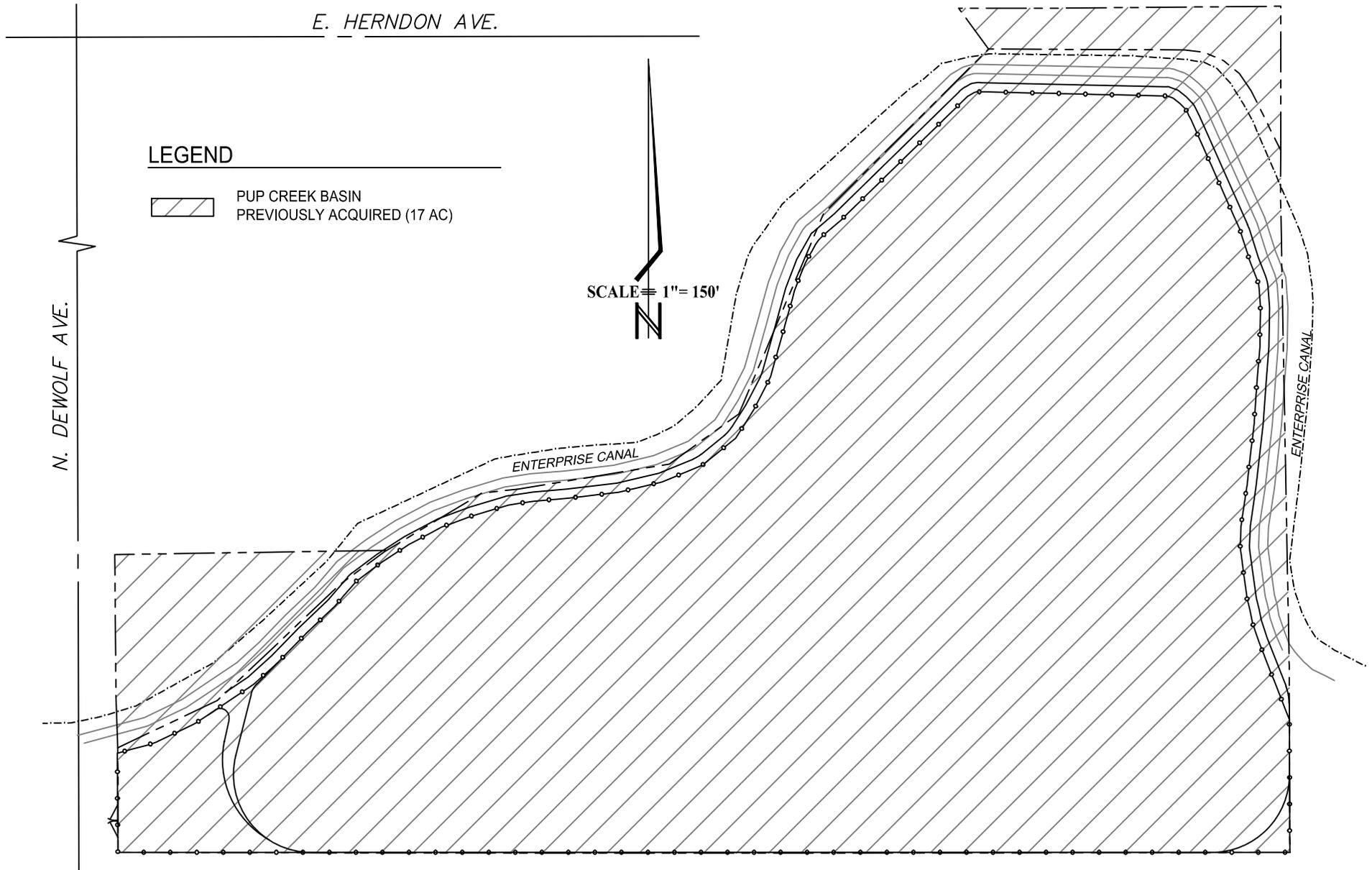
²Excludes 48.3 acre-feet already provided by State of California for Freeway 168

³60,000 cubic yards from excavation

The FMFCD has elected to proceed with the work at all four locations as one project identified as the Dry Creek Improvement Project. The facilities are or will be operated and maintained by FMFCD. All of the proposed work has already been initiated by FMFCD in the form of engineering, geotechnical investigations, land acquisition, and excavation for storage. But having made much progress, FMFCD is in need of the grant funds to complete the work by 2016 and has the necessary local match funding and is confident in its schedule for the work. The work will be awarded in accordance with FMFCD's typical public agency contract bidding, award, and administrative processes. The contracts will be divided into specific contracts of specialty work such as pump stations construction, earthwork and grading, fence installation, etc. to contain costs.

The Stormwater Flood Management Grant funds will be used to acquire land at three facilities and construct improvements at the four (4) facilities listed below. The list does not distinguish

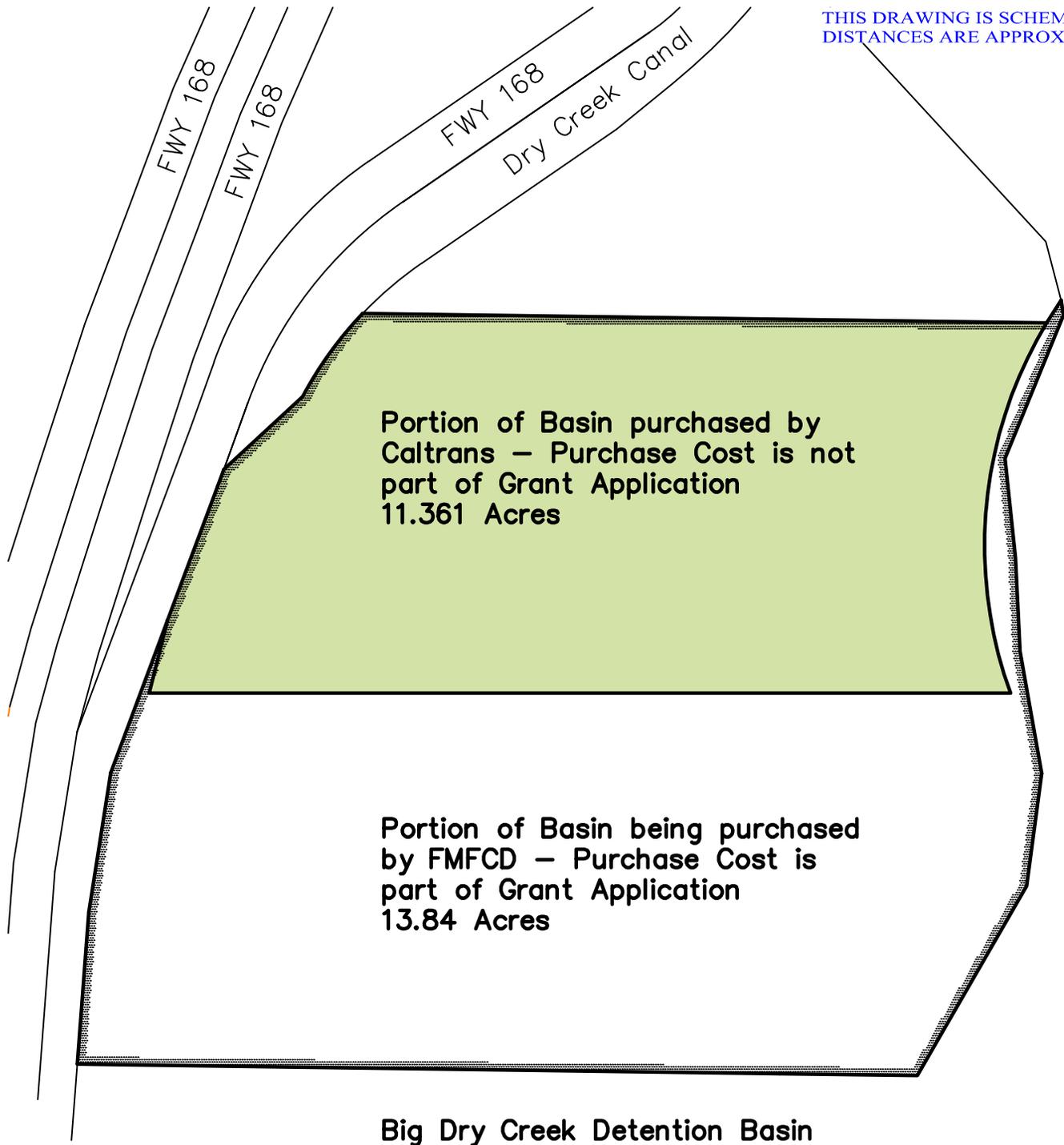
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PUP CREEK ENTERPRISE DETENTION BASIN LAND ACQUISITION

FIGURE 3-6

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LEGEND



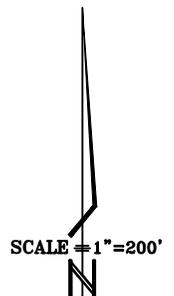
Acquisition And Excavation Excluded From Grant



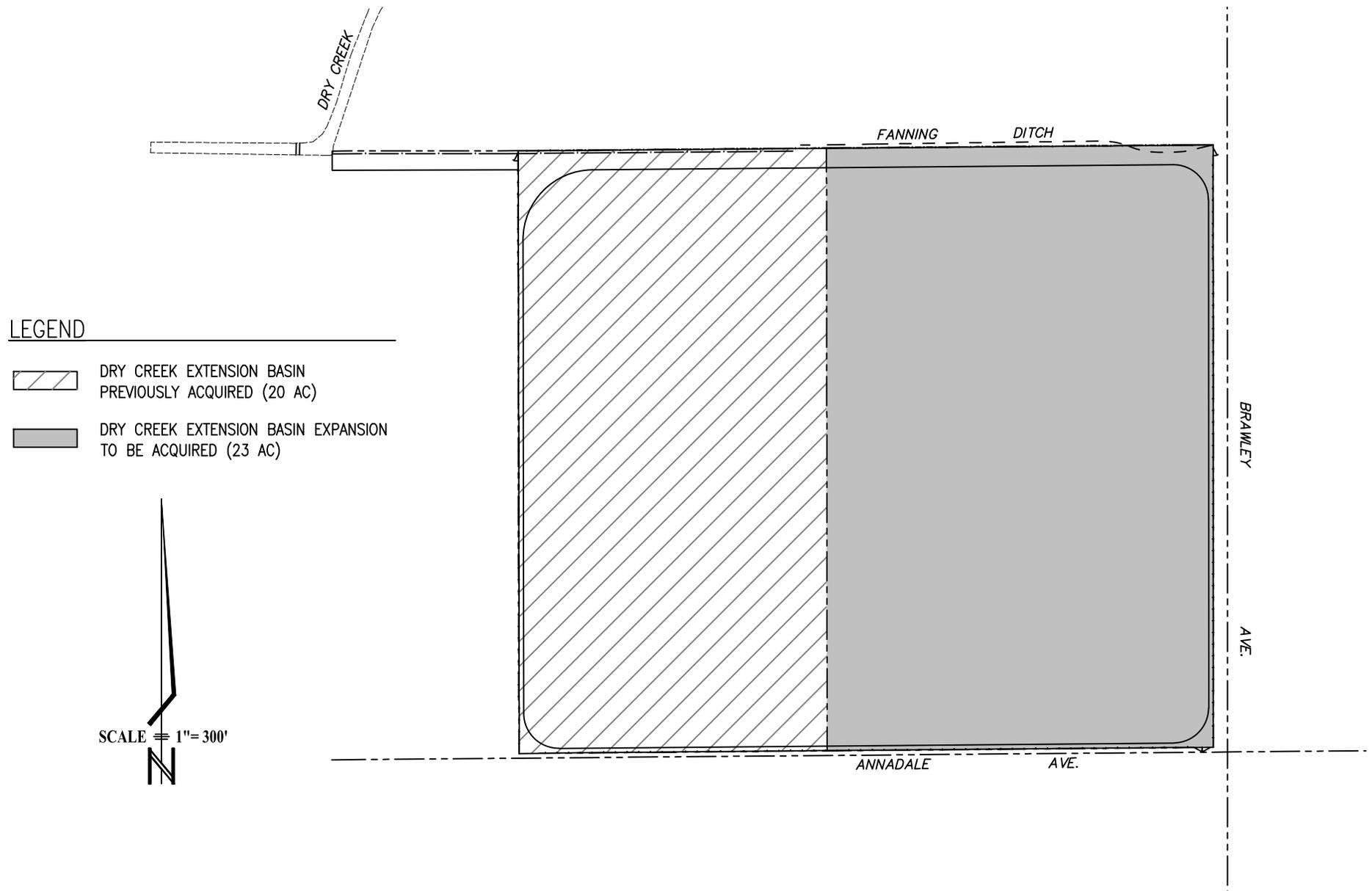
Acquisition And Remaining Excavation Included In Grant

BIG DRY CREEK DETENTION BASIN LAND ACQUISITION

FIGURE 3-7



NOTE:
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DRY CREEK EXTENSION BASIN LAND ACQUISITION

FIGURE 3-8

between work or acquisitions already completed for match funding credit and that to be funded with State grant funds. FMFCD will request credit for work, land, and improvements, that precede grant approval/award and credit for staff work following September 30, 2008 and approval/award of grant.

FMFCD is not claiming credit or reimbursement for the following items:

- Pup Creek-Enterprise Detention Basin - Future excavation of 150 acre-feet (242,000 cubic yards) after December 31, 2016.
- Big Dry Creek Detention Basin - 11.36 acres acquired by State for Freeway 168, excavation completed for 48.3 acre-feet by State, and excavation completed prior to this application by FMFCD at no cost. However, approximately 60,000 cubic yards remaining to be excavated is included.
- Dry Creek Detention Basin - Excavation of the basin obtained at no cost.

FMFCD is claiming credit or reimbursement for the following items:

- Big Dry Creek Dam - construct a deep toe drain on the downstream side of the dam with dewatering pump and telemetry system. (Please reference Figure 3-2)
- Pup Creek-Enterprise Detention Basin – acquire land and construct improvements to convey flood waters beneath the Enterprise Canal, construct a concrete lined broad crested weir, construct a turnout structure from the Enterprise Canal with meter or measuring device, install perimeter fence, earthwork within the basin, internal pipelines pump station, telemetry station, installation of a base rock recreational trail with a rest stop/shade structure/wildlife observation station. (Please reference Figure 3-3)
- Big Dry Creek Detention Basin - acquire land, construct a turnout and check structure pipeline from Big Dry Creek into the basin with meter or measuring device, a dewatering pump station with telemetry station, outfall structure, inlet structure, internal pipelines, perimeter fencing, top area perimeter landscaping, earthwork, new chain link security fence on east side, and base rock for access road. (Please reference Figure 3-4)
- Dry Creek Extension Basin - replace Fanning Ditch from Dry Creek to east property line of the proposed basin with a pipeline, construct a pump station, internal basin pipelines, an outfall/intake structure and meter or measuring device, install a telemetry system, construct a backup structure with baffle wall, two gate valves, perimeter fence, lower Annadale roadway, and base rock/oil. Also, includes the purchase of 43 acres, 20 of which is already acquired and 23 acres is yet to be acquired. (Please reference Figure 3-5)

Goals and Objectives

The Project addresses a significant safety concern at Big Dry Creek Dam, allows better and safer routing of flood waters, and better management of stormwater runoff to accomplish the following primary goals:

- 1) improve the safety of the storage of flood water at Big Dry Creek Dam and reduce the risk of flood damages to the downstream communities,

- 2) increase storage and capacity within the FMFCD’s regional stormwater basin system and thereby reduce flood risk and flood damages,
- 3) increase groundwater recharge to the local groundwater aquifer and re-use surface water for irrigating landscape to minimize groundwater extraction,
- 4) reduce pollutants in approximately 348 acre-feet of stormwater annually, which includes 52.2 tons of sediment removed annually,
- 5) enhance recreational opportunities along the Pup Creek-Enterprise Basin by placement of an adjoining recreational trail,
- 6) provide public education and outreach with a rest stop/shade structure/wildlife observation station at Pup Creek-Enterprise Detention Basin,
- 7) increase aquatic ecosystem and habitat for wildlife at each of the four facilities secured with fence protection at the three detention basins,

The Upper Kings Basin IRWMP regional goals are consistent with this application and are as follows (page 5-3) (Refer to http://krcd.org/pdf_ukbirwma/20121017_KB_IRWMP.pdf or FMFCD’s Water Resources web page <http://www.fresnofloodcontrol.org/waterresources/index.html>):

- RG1 Halt, and ultimately reverse, the current overdraft and provide for sustainable management of surface and groundwater;
- RG2 Increase water supply reliability, enhance operational flexibility, and reduce system constraints;
- RG3 Improve and protect water quality;
- RG4 Provide additional flood protection; and
- RG5 Protect and enhance aquatic ecosystems and wildlife habitat.

The storage provided in each facility will allow capture and/or delivery of water that will percolate and contribute to the Upper Kings Basin’s efforts to correct the region’s groundwater overdraft. As mentioned in the Upper Kings Basin’s IRWM Plan, (page 5-3) “*groundwater overdraft continues to be a significant concern for the Kings Basin.*” Improving the Big Dry Creek Dam will not only reduce the likelihood of severe flooding due to dam failure, but it will also allow FMFCD greater flexibility of release rates and longer retention of flood water near the end of the flood season to increase the volume of stormwater that can percolate into the ground. This also applies to the three (3) proposed basin sites. These basins will contribute to the groundwater preservation by capturing stormwater runoff that currently must be transported outside of the groundwater basin due to lack of storage. Also these facilities will be incorporated into an active groundwater recharge program during the non-rainy season.

The Project also meets ten out of fifteen of the Kings Basin IRWM Plan’s (See pages 5-4 & 5-5.) measurable objectives as listed below:

- MO1:** Increase amount of groundwater in storage with intent to eliminate the groundwater overdraft in 20 years;
- MO3:** Identify DAC priority needs and promote/support solutions to DAC water issues;
- MO4:** Increase average annual supply and reduce demand;

- MO5:** Increase dry year supply;
- MO6:** Increase regional conveyance capacity;
- MO9:** Identify sources of water quality problems and promote/support solutions to improve water quality;
- MO10:** Increase surface storage;
- MO12:** Pursue opportunities to incorporate habitat benefits into projects;
- MO13:** Increase public awareness of IRWM efforts;
- MO14:** Involve local water districts and land use agencies in generating and confirming the current and future water needs to ensure compatibility and consistency with land use and water supply plans.

Physical Benefits

The improvements will provide the following overall regional stormwater management benefits; increased flood protection through increased system storage capacity and flood flow routing, increased recharge, increased retention of flood waters within the region that is currently lost due to lack of storage capacity, and increased ecosystem/wildlife habitat.

These and other benefits more specific to location are as follows:

- Big Dry Creek Dam - Dam safety, flood damage reduction, late season storage and recharge, wildlife enhancement, and water quality;
- Pup Creek-Enterprise Detention Basin – correct and improve flood routing, recharge, recreation, wildlife enhancement, and water quality;
- Big Dry Creek Detention Basin – better flood routing control and flexibility, recharge, reuse of surface water in lieu of potable water, and more ecosystem/wildlife habitat, improved aesthetics along Freeway 168; and
- Dry Creek Extension Basin - improved flood routing control and flexibility, recharge, and more ecosystem/wildlife habitat.

The grant projects will increase the capacity of the regional stormwater basin system and thus increase the District’s operational options to store, treat and recharge more stormwater runoff, realizing additional flood control and water quality benefits.

Each of these projects yields multiple benefits that include:

- Reduced risk of flooding and flood damages;
 - Increased public health and safety protection;
 - Improved stormwater management and flood routing flexibility;
 - Improved system reliability;
- Increased groundwater recharge efforts;
 - Water re-use for irrigating landscape;
- Improved water quality;
- Habitat and wildlife improvements;
- Public education and outreach opportunities and recreational trail;
 - Rest stop/shade structure/observation pavilion benefit;

- Greenhouse emissions saved; and Efficiency and Operational Cost Savings.

Purpose and Need

The purpose of this proposal is to implement improvements that will reduce the risk of flooding and flood damages, improve and ensure public health and safety, and increase groundwater recharge. These benefits accrue to the City of Clovis, the City of Fresno, and the urban portion of Fresno County within FMFCD’s boundary. These areas are largely identified as a Disadvantaged Community¹ (DAC). Each of the following locations contribute an essential part to the overall Project and individually in managing stormwater runoff to reduce flood damages, improve and ensure public health and safety, and increase groundwater recharge.

Big Dry Creek Dam

The dam improvement would construct a deep toe drain (fifteen feet) on the downstream side of the dam for a length of approximately 7,000 feet. It includes dewatering pumps to remove water that would otherwise surface at the toe of the dam. A telemetry station will monitor the dewatering conditions. Please reference Figure 3-2.

The dam can store the Standard Project Flood within its reservoir. However, currently, seepage beneath the dam has surfaced as boils at the toe of the dam when the storage is at 42% of its capacity. This is cause for safety concerns, close monitoring, and perhaps unmanageable operating conditions at greater storage levels.

The primary objective of this feature improvement is to remediate seepage boils at the toe of the dam lessening the risk of failure due to undermining of the earthen dam structure. On September 15, 1995, a Dam Breach Analysis for Big Dry Creek Dam was completed by the USACE. A dam breach model was performed in the condition of breaching at full capacity and the dam breach model demonstrated a hydrograph with a peak flow of 69,900 ft³/s occurring one (1) hour after the breach. After 14 hours, the resulting flows would inundate an area covering over 56 square miles which includes central Fresno, nearly half of Clovis, over 50 schools, several farmlands, and more. The simulated dam breach occurred with the water surface at the spillway crest elevation of 432.7 USGS datum. The Dam Breach Analysis is included in Appendix 3-2.

Over several years, the FMFCD has consulted with BSK Associates Engineers & Laboratories (BSK) regarding analysis and evaluations of the seepage. From the consultations, FMFCD decided to pursue the installation of a toe drain 15 feet deep on the downstream side of the dam for a length of approximately 7,000 feet and with dewatering pumps.

¹ Disadvantage Community (DAC) means a community with a median household income less than 80 percent of the statewide annual median household income (PRC §75005(g)).

The toe drain improvement is needed to reduce risk of a dam breach, improve operational safety and restore the assurance of flood protection for a metropolitan area with a population of over 598,000 residents. Also, the improvement would allow some water retention at the dam near the end of the rain season and the distribution of that water downstream for groundwater recharge purposes. FMFCD staff estimates this capture to be about 1,000 acre-feet every four years. The recharge would benefit the downstream metropolitan area that is experiencing a depleting groundwater table.

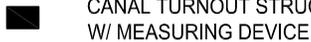
Pup Creek-Enterprise Detention Basin

With the acquisition of the land and completion of improvements, the Pup Creek-Enterprise Detention Basin will provide flood protection by capturing stormwater runoff from Pup Creek that would otherwise overtop the Enterprise Canal and flow downstream. The result is that this water is transferred into the urban area and will create flooding by overtopping the canal or cause urban stormwater pumps to be turned off so as not to overtop the canal, but yet result in the same flooding. Pup Creek-Enterprise Basin provides improved conveyance beneath the Enterprise Canal, constructing a concrete lined broad crested outlet weir, constructing a canal turnout structure, earthwork, pump station with telemetry system, and installing a perimeter fence. This basin will serve to attenuate flood flow from the Pup Creek watershed, divert flows between the Enterprise Canal and Pup Creek as necessary and capture flow for additional groundwater recharge. The basin not only has the potential to rectify the flood routing deficiency as discussed in the Physical Benefit above, but also will provide storage capacity of 50 acre-feet with the Project and another 150 acre-feet in the future. Only 50 acre-feet of capacity will be created in the grant Project and the benefits analysis for the grant only considers the 50 acre-feet of flood reduction benefit. FMFCD will continue to excavate the basin following the grant period and obtain the greater benefit up to 200 acre-feet. The Project improvements are shown on Figure 3-3 and the ultimate post project condition is shown on Figure 3-9.

Additionally, the basin has the potential to recharge 120 acre-feet annually as a result of the grant work. FMFCD will have the basin excavated over time following the completion of the grant improvement at local expense. The plan is to greatly reduce costs by allowing excavation by local contractors needing fill material. As this excavation occurs, the storage increases and the basin can be operated as an incised facility.

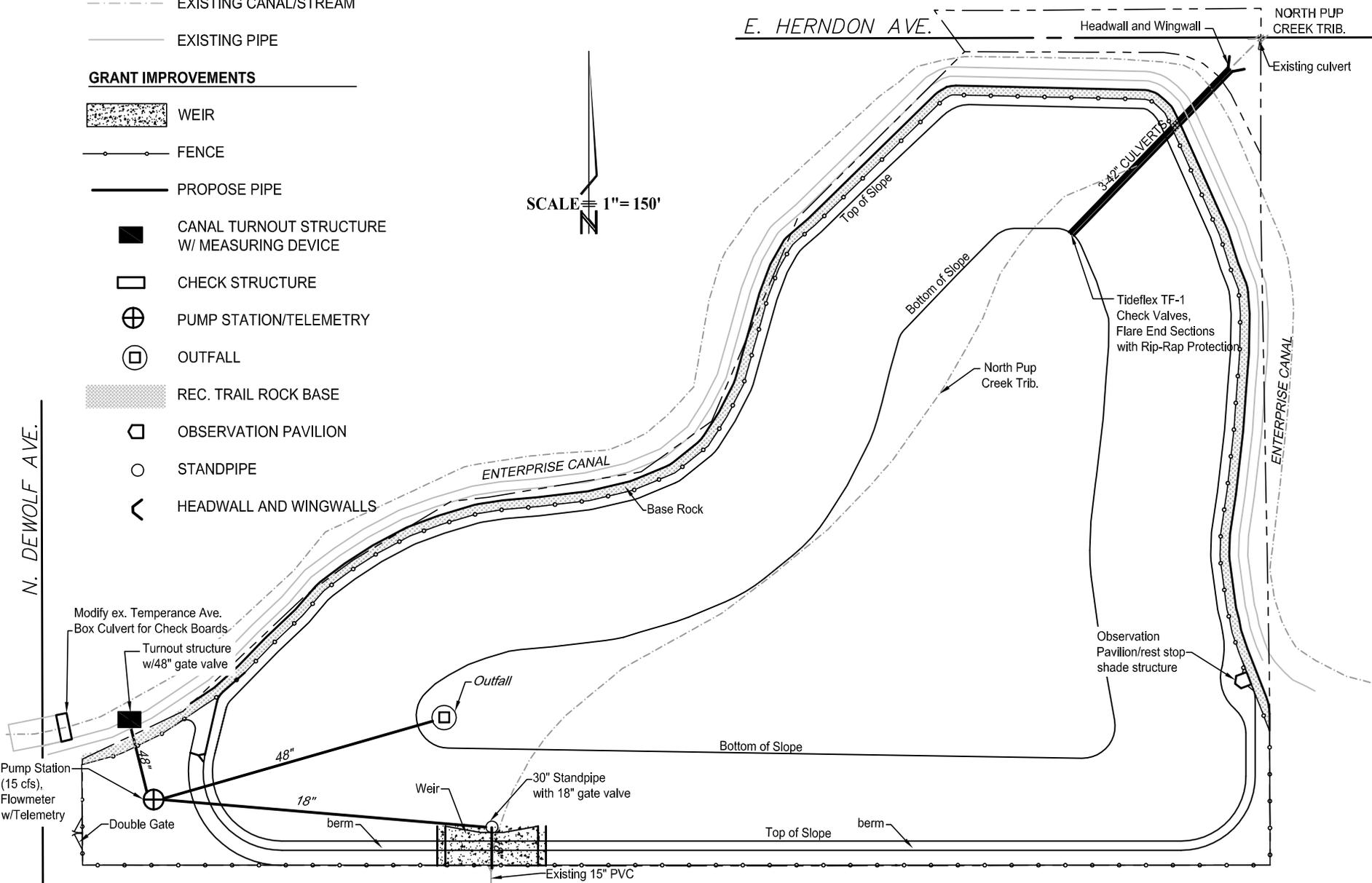
The detention basin also avoids the risk of flooding and flood damages along the main Pup Creek channel downstream of the Enterprise Canal. Currently the culverts beneath the Enterprise Canal restrict the flood flows beneath the canal and cause the flows to overtop the canal. This adds an additional 147 cfs into the canal. There is not capacity in the downstream canal for this additional flow creating flooding in the urban area in storm exceeding approximately a 25-year event frequency. The improvements will not only increase public safety and health regarding flooding and road access, but it also will improve stormwater management, provide and protect aquatic ecosystem and wildlife, and improve system reliability.

LEGEND

- - - - - EXISTING CANAL/STREAM
- — — — — EXISTING PIPE
- GRANT IMPROVEMENTS**
-  WEIR
-  FENCE
-  PROPOSE PIPE
-  CANAL TURNOUT STRUCTURE W/ MEASURING DEVICE
-  CHECK STRUCTURE
-  PUMP STATION/TELEMETRY
-  OUTFALL
-  REC. TRAIL ROCK BASE
-  OBSERVATION PAVILION
-  STANDPIPE
-  HEADWALL AND WINGWALLS

SCALE = 1" = 150'

NOTE:
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DISTANCES ARE APPROXIMATE.



PUP CREEK-ENTERPRISE DETENTION BASIN IMPROVEMENT POST PROJECT

FIGURE 3-9

FRESNO METROPOLITAN FLOOD CONTROL DISTRICT

DRAWN BY: RP
CHECKED BY:
DATE: 1/29/13



Big Dry Creek Detention Basin

This detention basin serves three purposes: i) drainage for a portion of Freeway 168, ii) capacity for urban Drainage Area “C”, and iii) detention of flood flows in Big Dry Creek. The portion of this basin acquired and excavated for the benefit of drainage from Freeway 168 is **not** included in this grant application. (See Figure 3-7) The FMFCD expanded the basin into an adjoining 13.8 acres. Only the further expansion of the basin by FMFCD is included in the grant Project and the improvements herein proposed for the basin.

The basin will continue to provide drainage service to 107 acres of Freeway 168. It will accept and supplement capacity for local Drainage Area “C” to bring the capacity serving this drainage area to current storage standards. It will also provide storage capacity to attenuate flood flows from Big Dry Creek, improving the overall flood protection to downstream properties. The design capacity for the basin is a gross pool of approximately 260 acre-feet and allocated as shown below:

<u>Service Area</u>	<u>Storage Allocation</u>
Freeway 168	48.3 acre-feet (Excluded from Grant benefits)
Local Drainage Area “C”	18.0 acre-feet
Flood Detention	193.7 acre-feet

The basin will also recharge approximately 660 acre-feet of water annually to the local area’s groundwater aquifer and provide the flexibility to release any waters to other downstream facilities for groundwater recharge purposes.

The improvements include installation of a pump station with telemetry, pipeline connection to Big Dry Creek with meter or measuring device, a check structure in Big Dry Creek, fence relocation, completion of excavation, top perimeter landscaping with irrigation pump to draw water from the basin (landscaping on State’s portion included in grant). Please reference Figure 3-4.

Dry Creek Extension Basin

Dry Creek Extension Basin is partially acquired and constructed, but it isn’t currently operable due to the lack of connection facilities and security fences. The grant work proposed for this site includes the acquisition of an additional 23 acres. The proposal will benefit from the storage capacity of the site, but FMFCD intends to complete the excavation of the basin without cost or credit in the grant. Other work included in the grant is to install a pump station, replace a portion of Fanning Ditch as pipeline, install internal basin pipelines and outfall/intake structures with meter or measuring device, install a telemetry system, construct a backup structure with baffle wall and two gate valves, and a perimeter fence. The basin is in a key location to divert flood flows from Big Dry Creek and the Fanning Ditch. In addition to accepting peak flows, the basin can also serve to accept stormwater from urban basins earlier in the rain event to lessen the risk of exceeding urban basin capacities from subsequent storm events. This will result in less discharge of stormwater outside of the local region and provide an extra 1,000 acre-feet groundwater recharge annually reducing the groundwater overdraft.

The basin will provide an aquatic ecosystem for wildlife in the southwest area of the FMFCD. Please reference Figure 3-5.

Project List

The Dry Creek Flood Control Improvement Project is the only project being submitted in this proposal. The Project includes improvement of the seepage control at Big Dry Creek Dam and creation of additional flood storage of 1,057 acre-feet (1,077 acre-feet with 20 acre-feet from percolation) distributed at three basin sites along Dry Creek or tributary to Dry Creek. The Project has multiple components that satisfy the program eligibility requirements of the Proposition 1E grant, meet all of the Kings Basin IRWMP goals previously discussed, and is included in the Kings Basin Authority Project List. Each component is scalable and provides certain specific benefits, but it is through their linkages and synergies that the benefits are enhanced to meet the overall Project goals and objectives. The Project will be constructed in phases. Table 3-1 describes the abstract, the status in terms of percent completed of design and the implementing agency for each of the Project’s components.

Project	Abstract	Status (% Design Completed)	Implementing Agency
Dry Creek Flood Control Improvement Project	The project involves modifications to FMFCD's flood control facilities in the Big Dry Creek, Pup Creek watersheds to reduce flood damages, improve public health and safety by remediating seepage at the toe of the Dam, and increase groundwater recharge. The Project includes the following components:		
	<u>Big Dry Creek Dam</u> The construction of a 7,000 foot long toe drain, 15 feet deep on the downstream side of the dam with dewatering pumps.	90%	FMFCD
	<u>Pup Creek-Enterprise Detention Basin</u> Acquiring and improving a 17 acre site. Improving the conveyance beneath the Enterprise Canal, earthwork, outlet weir, wildlife observation pavilion, pump station, telemetry system, and the installation of a perimeter fence, recreational trail and rest stop/observation pavilion.	10%	FMFCD
	<u>Big Dry Creek Detention Basin</u> Land acquisition (excluding State’s portion). Construct a diversion structure into the basin with a pump station, grading and excavating, perimeter fencing and landscaping.	10%	FMFCD
	<u>Dry Creek Extension Basin</u> Replace portions of the Fanning Ditch with a pipeline, excavate the basin (local cost), install a pump station, install internal basin pipelines, construct an outfall/ intake structure, and install perimeter fencing.	10%	FMFCD

Table 3-1: Design Status

Integrated Elements of Projects

The Dry Creek Flood Control Improvement Project includes improvement of the seepage control at Big Dry Creek Dam and creation of additional flood storage of 1,057 acre-feet (1,077 acre-feet with 20 acre-feet from percolation) distributed at three basin sites along Dry Creek or tributary to Dry Creek. The improvement of the safety of the dam and creation of the additional storage are each necessary to avoid downstream to the Big Dry Creek Floodplain. The needed storage is achieved collectively among the components of the Project to meet the overall Project goals and objectives. The Project’s components together will substantially reduce flood risk from major storm events to the Cities of Clovis and Fresno and urbanized area within FMFCD of Fresno County. Additionally, construction of the Project will allow FMFCD to better manage stormwater runoff by increasing storage capacity of the proposed facilities by 1,057 acre-feet (1,077 acre-feet with 20 acre-feet from percolation) and enhance operations through channels, pump stations, and other control structures. To reduce the public cost, the Project excludes from the grant funding a certain portion of the long term excavation at the Pup Creek-Enterprise Basin. The Dry Creek Extension Basin will be excavated during the grant construction period, but at no cost or grant funding (but benefits are included). The excavation work will be completed by local contractors in need of fill material, at their expense.

Regional Map

Figure 3-10 represents the location of State Plan of Flood Control (SPFC) Facilities in the San Joaquin River Basin and the Regional Map (Figure 3-11) shows the project location in relation to the nearest SPFC levee. The Project is included in the Tulare Lake Basin as designated by the DWR.

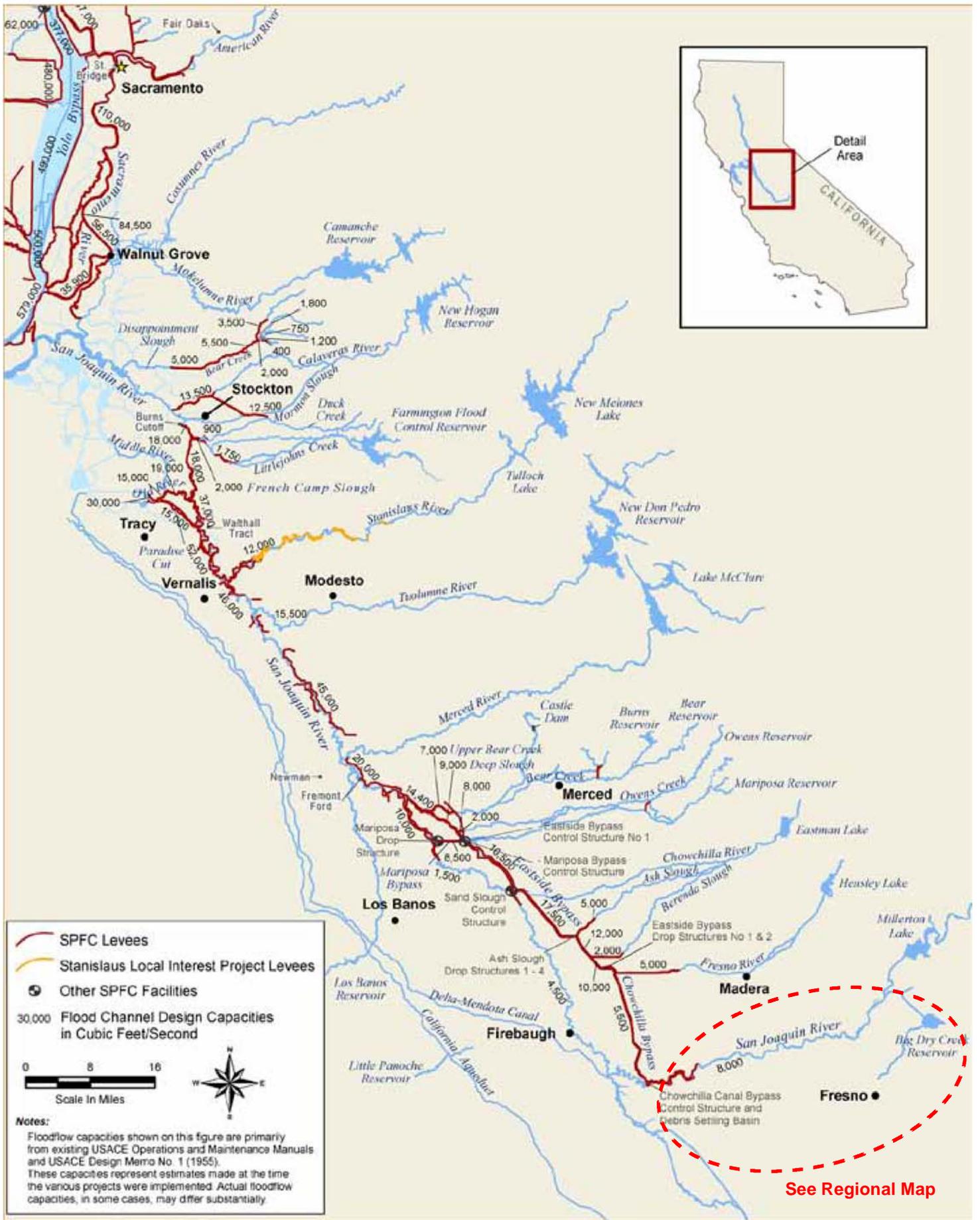
Completed Work

FMFCD prepares and completes CEQA analysis before property is purchased. Big Dry Creek Dam, Pup Creek-Enterprise Detention Basin, Big Dry Creek Detention Basin and Dry Creek Extension Basin will be or have been analyzed as separate CEQA documents, but will be reviewed together as the Big Dry Creek Flood Control Improvement Project by the FMFCD Board of Directors in a Public Hearing. Such hearing will confirm the CEQA for the Big Dry Creek Flood Control Improvement Project.

Big Dry Creek Dam

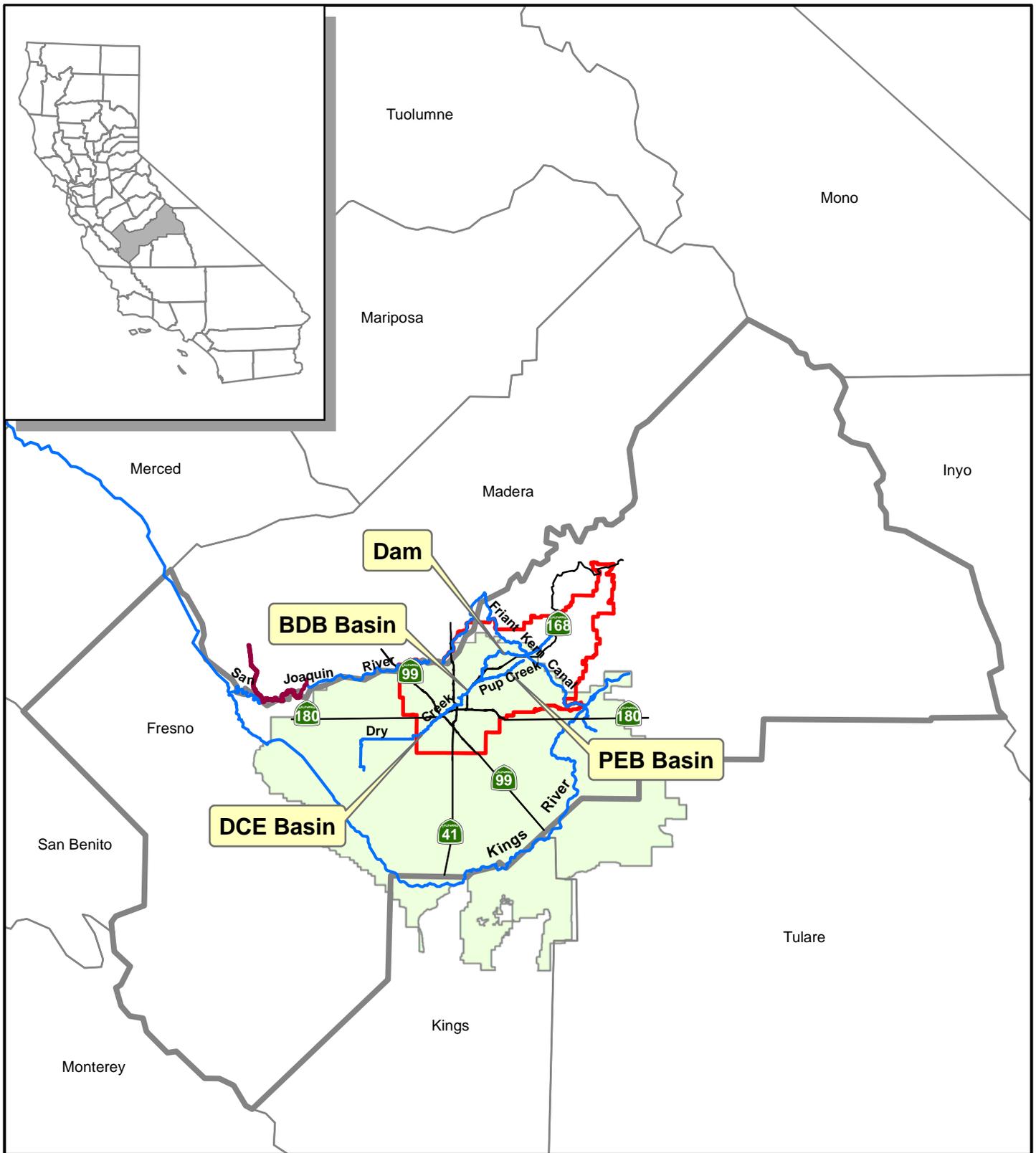
Twenty-eight (28) piezometers were installed and completed April 2009 and an additional eight (8) piezometers were installed by June 2011, under Contract BDR-18, to monitor seepage and the groundwater conditions along the Big Dry Creek Dam.

FMFCD retained URS Corporation as an environmental consultant, and it anticipates completing CEQA and other environmental documents by June 2013. The District has retained Blair, Church, and Flynn Consulting Engineers (BC&F) as a design consultant and it anticipates completing the plans and specifications prior to the grant award.



State Plan of Flood Control Facilities, San Joaquin River Basin Map
 Figure 3-10

See Regional Map



- Kings Basin
- FMFCD
- SPFC Levees
- Waterways

**Regional Map
Figure 3-11**

The plans and specifications for the toe drain and dewatering pumps are 90% complete. Figure 3-12 is a cross section of the toe drain modification.

Figure 3-13 shows the dam layout and location of boils identified by green station locations. The toe drain will be from station 60+00 to station 130+00.

Pup Creek-Enterprise Detention Basin

On April 11, 2012, FMFCD completed the CEQA documents and the FMFCD’s Board of Directors approved the Construction of Stormwater Retention Basin (Pup Creek-Enterprise Basin), and Culvert Replacement improvements. In regards to the CEQA, the following environmental determinations were made:

- The Project will not have a significant effect on the environment.
- A Negative Declaration was prepared for the Project pursuant to the provisions of CEQA.
- Mitigation measures were made a condition of the approval of the Project.
- A mitigation reporting or monitoring plan was adopted for this Project.
- Findings were made pursuant to the provisions of CEQA.

The Notice of Determination (NOD) attached and referred to as Appendix 3-3 lists the environmental determinations.

The property was acquired and recorded July 18, 2012, with a purchase price of \$318,696, and comprises approximately 17.1 acres. In addition, FMFCD spent roughly \$18,000, on staff time, and legal and appraisal fees associated with this purchase

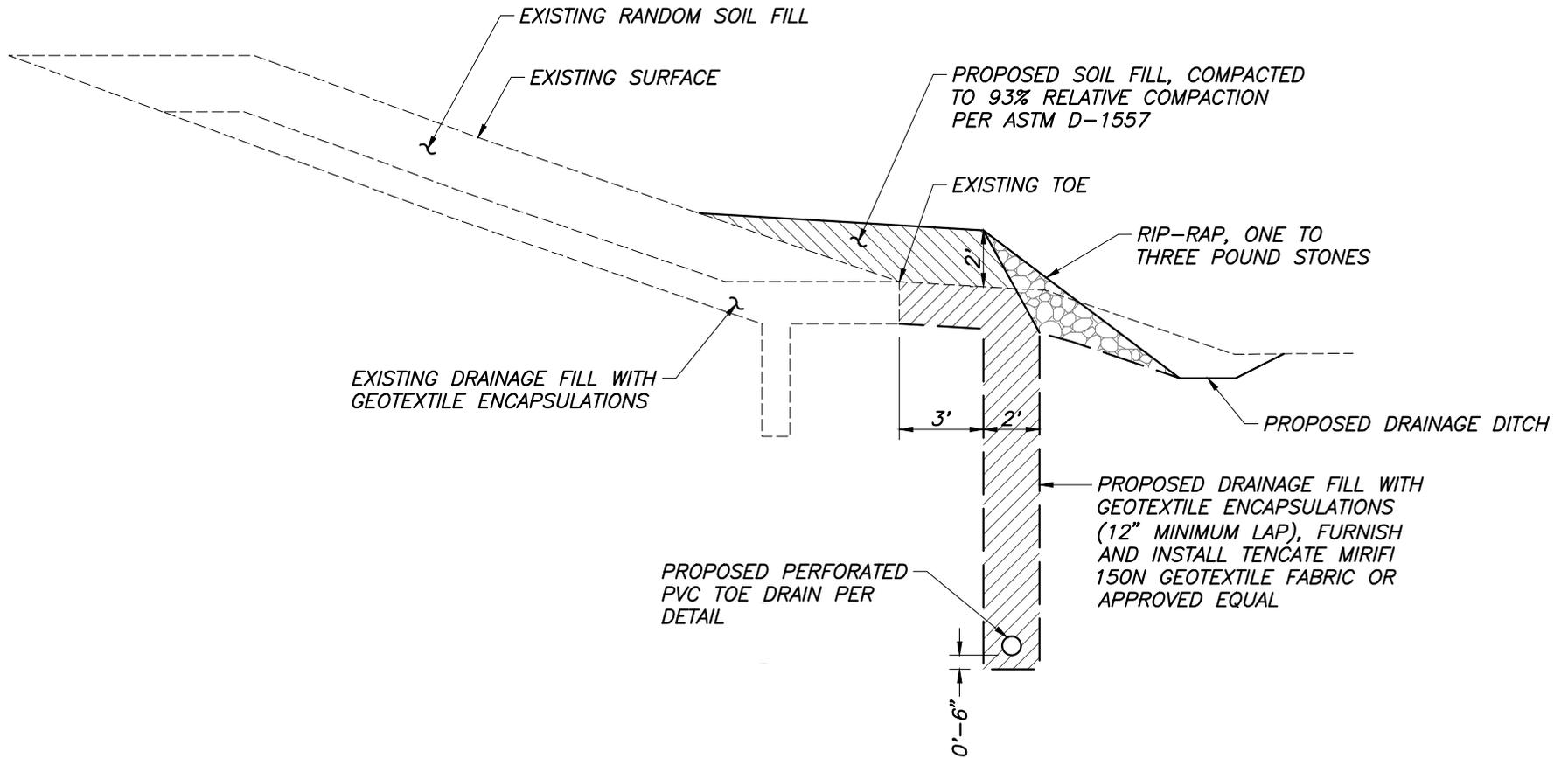
Big Dry Creek Detention Basin

A Mitigated Negative Declaration (MND) was completed in August, 1993, by the California Department of Transportation and the following environmental determinations were made:

- The Project will not have a significant effect on the environment.
- A Negative Declaration was prepared for the Project pursuant to the provisions of CEQA.
- Mitigation measures were made a condition of the approval of the Project.
- Findings were made pursuant to the provisions of CEQA.

Because the MND was completed 20 years ago, in January 2013, FMFCD reviewed the project and that found no additional effects will occur, so a Notice of Exemption (NOE) was prepared and filed (See Appendix 3-4).

FMFCD is nearing completion of the purchase of approximately 11.8 acres from the City of Fresno, Department of Aviation. FMFCD is anticipating completion of the land acquisition by March 2013. The State portion of the basin will be completed by the State and its acquisition and excavation cost are not included in the grant.



TOE DRAIN TRENCH DETAIL

FIGURE 3-12



286	568313.87	1808538.53	424.66	8+00.00	505
287	568269.32	1808515.63	424.64	8+50.00	506
288	568224.77	1808493.13	424.70	7+00.00	507
289	568180.22	1808470.43	424.67	7+50.00	508
290	568134.63	1808442.48	424.67	7+00.00	509
291	568135.67	1808447.73	434.3	8+00.00	510
292	568091.12	1808425.02	434.3	8+50.00	511
293	568046.57	1808402.32	435.1	9+00.00	512

PROFILE OF CARSON AVE.

265	566584.79	1807214.48	435.37	0+00	516
266	566504.86	1807226.70	435.50	0+23.5	517
267	566523.06	1807237.71	435.70	0+46.52	518
268	566566.32	1807259.26	436.78	0+93.06	519
269	566718.92	1807274.10	438.50	1+48.60	524
270	566764.89	1807259.42	436.86	1+97.46	525
271	566809.07	1807225.18	432.98	2+53.35	526
272	566844.18	1807196.04	430.26	2+98.98	527
273	566878.13	1807166.88	427.92	3+44.24	528
274	566891.68	1807134.01	423.88	3+95.22	529
275	566901.12	1807100.54	422.02	4+46.97	530
276	566930.13	1807070.40	415.30	4+93.77	531

CURVE	RADIUS	LENGTH	TANGENT	CHORD	DELTA
C1	100.00'	159.25'	102.20'	142.96'	91°14'41"
C2	100.00'	166.91'	99.83'	141.30'	89°54'00"
C3	100.00'	157.32'	100.24'	141.39'	90°08'00"
C4	100.00'	158.50'	99.42'	141.01'	89°39'51"
C5	250.01'	142.50'	73.24'	140.58'	32°39'25"
C6	200.01'	253.87'	147.54'	237.25'	72°45'17"
C7	300.01'	364.42'	208.90'	342.43'	69°35'45"
C8	300.01'	286.73'	155.57'	275.94'	54°45'29"
C9	325.02'	123.26'	62.38'	122.52'	21°43'45"
C10	140.01'	86.29'	34.04'	68.16'	27°19'56"
C11	140.01'	113.10'	59.84'	110.05'	46°17'03"

LINE	DIRECTION	DISTANCE
L1	N 88°45'19" E	757.70'
L2	S 00°00'00" E	487.62'
L3	S 89°54'00" E	359.50'
L4	N 00°02'00" W	504.12'
L5	N 89°37'51" E	278.06'
L6	S 87°32'15" E	682.67'
L7	S 87°27'58" W	633.13'
L8	S 32°42'29" W	382.31'
L9	S 33°44'00" W	361.58'
L10	S 54°20'00" W	492.62'
L11	S 27°00'04" E	757.56'
L12	S 19°16'58" E	47.17'

LEGEND:
 — 89+00 BOIL LOCATIONS

**LOCATION OF BOILS MAP
 FIGURE 3-13**

Dry Creek Extension Basin

On November 20, 2002, FMFCD’s Board of Directors approved the Acquisition and Construction of Dry Creek Extension Basin, and completed the CEQA documents. A 20-acre parcel was acquired in exchange for exclusive rights to the material on the property and the deed was recorded September 4, 2009. CEQA documents indicate the following environmental determinations:

- The Project will not have a significant effect on the environment.
- A Mitigated Negative Declaration was prepared for the Project pursuant to the provisions of CEQA.
- Mitigation measures were made a condition of the approval of the Project.

The NOD is attached and referred to as Appendix 3-5 which lists the environmental determinations on page 1.

Soil investigations were completed by FMFCD staff in December, 2011. A power line crossing the property was relocated March 14, 2012 with a payment to PG&E of \$49,833.00. District engineering consultants conducted several surveys that at a cost of \$3,427.31.

With respect to acquisition of the additional 23 acres easterly of the original 20 acres, FMFCD started the CEQA work on January 4, 2013 and plans to complete the work around May, 2013.

Overall Project Status and Check List

Table 3-2 describes the status of the overall Project per component along with a check list of work to be completed. The status is in terms of percent of each component that is completed.

Overall Project Status and Check List	Status (% Project Completed)
Below is a check list of items completed (✓) and to be completed (□) per component of the Project:	
<p><u>Big Dry Creek Dam</u></p> <ul style="list-style-type: none"> ✓ Land Purchase/Easement ✓ Assessment and Evaluation prior to preparation of plans ✓ 90% Final Design ✓ Authorization to start Mitigated Negative Declaration (MND) and CEQA □ 100% Final Design and Specifications □ Complete MND and CEQA □ Construction 	60%
<p><u>Pup Creek-Enterprise Detention Basin</u></p> <ul style="list-style-type: none"> ✓ Land Purchase ✓ Assessment and Evaluation prior to preparation of plans ✓ Final Basin Design ✓ Authorization to start Mitigated Negative Declaration (MND) and CEQA ✓ Complete NOD and CEQA 	63%

Overall Project Status and Check List	Status (% Project Completed)
<ul style="list-style-type: none"> <input type="checkbox"/> 90% Final Design <input type="checkbox"/> 100% Final Design and Specifications <input type="checkbox"/> Construction 	
<p><u>Big Dry Creek Detention Basin</u></p> <ul style="list-style-type: none"> ✓ Assessment and Evaluation prior to preparation of plans ✓ Final Basin Design ✓ Authorization to start Mitigated Negative Declaration (MND) and CEQA ✓ Complete MND, NOE, and CEQA ✓ 90% excavated <input type="checkbox"/> Land Purchase <input type="checkbox"/> 90% Final Design <input type="checkbox"/> 100% Final Design and Specifications <input type="checkbox"/> Construction (Improvements and 10% of soil to be excavated) 	55%
<p><u>Dry Creek Extension Basin</u></p> <ul style="list-style-type: none"> ✓ Assessment and Evaluation prior to preparation of plans ✓ Final Basin Design ✓ Authorization to start Mitigated Negative Declaration (MND) and CEQA ✓ 20 acres: Complete NOD, MND and NOE ✓ 20 acres: Land Purchase <input type="checkbox"/> 23 acres: Complete MND and NOE <input type="checkbox"/> 23 acres: Land Purchase <input type="checkbox"/> 90% Final Design <input type="checkbox"/> 100% Final Design and Specifications <input type="checkbox"/> Construction 	55%

Table 3-2: Overall Project Status and Check List

Existing Data and Studies

Several assessments and evaluations of Big Dry Creek Dam, Pup Creek-Enterprise Basin, Big Dry Creek Basin, and Dry Creek Extension Basin were conducted by FMFCD, FMFCD consultants, California Division of Safety of Dams (DSOD) and/or by the USACE.

On September 15, 1995, a Dam Breach Analysis for Big Dry Creek Dam was completed by the USACE. A dam breach model was performed with the condition of breaching at full capacity. The dam breach model demonstrated a hydrograph with a peak flow of 69,900 ft³/s occurring one hour after the breach. After approximately 11 hours following the breach, 12 miles below the dam and with attenuation reducing the peak flow, the Southern Pacific rail line near Highway 99 would experience a 44,300 ft³/s flow. And at the 14th hour, the resulting flows would inundate an area covering over 56 square miles which includes central Fresno, nearly half of Clovis, over 50 schools and several farmlands. Note that the simulated dam breach occurred with the water surface at the spillway crest elevation of 432.7 USGS datum. The Dam Breach Analysis is included in Appendix 3-2.

On April 11, 2006, an Engineer from the DSOD and the USACE, along with Jerry Lakeman, the District Engineer for FMFCD, and other FMFCD employees did a joint inspection of the boils and seepage condition at the Dam. Twenty-eight (28) boils were observed at the time of inspection. Ultimately, there were a total of 44 noteworthy boils and seepage locations. Two days later, the DSOD provided a list of recommendations (See Appendix 3-6). Because there were no past performance data of the Dam with surface water elevation above 422.5 feet in elevation, the DSOD recommended 24-hour surveillance if the reservoir is to rise at or above 422.5 feet. On December 6, 2007, the USACE also responded with recommending the dam “deserves additional study”.

The FMFCD’s geotechnical consultant recommended the FMFCD drill and install piezometers along the embankment to establish a monitoring program. In April, 2009, twenty-eight (28) piezometers were installed between Stations 63+00 and 121+85. Also, eight (8) more were installed between Stations 154+52 and 179+62 and completed by June, 2011. The work was completed under FMFCD Contract BDR-18 for the purpose to monitor seepage along the Big Dry Creek Dam.

BSK installed thirty-six (36) piezometers along the Dam and performed several years of seepage and groundwater analysis and conceptual designs for mitigating seepage and sand boils. In their January 22, 2013 report (Appendix 3-15), they addressed the seepage and sand boils observation in 2006 and presented seepage mitigation alternatives.

FMFCD staff conducted soil investigations at 12 locations within the 20 acres of Dry Creek Extension Basin and prepared a soil profile by December 2011. The data indicated that the site is very sandy and that this would be a great site for a detention and recharge basin to manage stormwater runoff and improve overall water recharged to the local area’s aquifer.

Table 3-3 lists all assessments and evaluations that were prepared in regards to the seepage issue at Big Dry Creek Dam.

Assessment and Evaluation Submittals	Dates	Appendix
Memo-Inspection of Reported Boils and Seepage Conditions at Big Dry Creek Dam	April 2006	3-6
Letter-Big Dry Creek Dam Seepage and Redbank Detention Basin Control	April 2008	3-7
Letter-Red Bank Detention Basin and Big Dry Creek Dam	May 2008	3-8
Prelim Seepage Study Report	January 2013	3-9
Contract BDR-18: Work Plan Piezometer Installations	November 2008	3-10
Contract BDR-18: Piezometer Installations	May 2009	3-11
Supplement Prelim Seepage Study	June 2009	3-12
Work Plan Piezometer Installations	November 2010	3-13
Contract BDR-18: Seepage Control Alternatives Report	November 2010	3-14

Assessment and Evaluation Submittals	Dates	Appendix
Contract BDR-18: Piezometric Data Evaluation Report	January 2013	3-15
Contract BDR-18: Piezometer Installations	June 2011	3-16

Table 3-3: Assessment and Evaluation Submittals

Project Map

The Project Map (Figure 3-14) displays a map with the location of all four (4) components and their linkages.

Project Specifics

The Project is located approximately twenty-seven (27) miles directly east from the nearest State Plan of Flood Control (SPFC) Levees or structures and that would be the Chowchilla Canal Bypass Control Structure. The Dry Creek Flood Control Improvement Project is located within the Tulare Lake Basin and is not part of the SPFC as defined in ^{1,2}Water Code Section 8523 and 12646(e) and in the ³California Water Plan Update 2009. Table 3-4 provides an explanation of how the Project is not part of the SPFC by identifying the sites specific geographic location, the Project’s function with relation to other stormwater conveyance systems, and describing the Project’s operations and maintenance liability associated with the San Joaquin River Flood Control System.

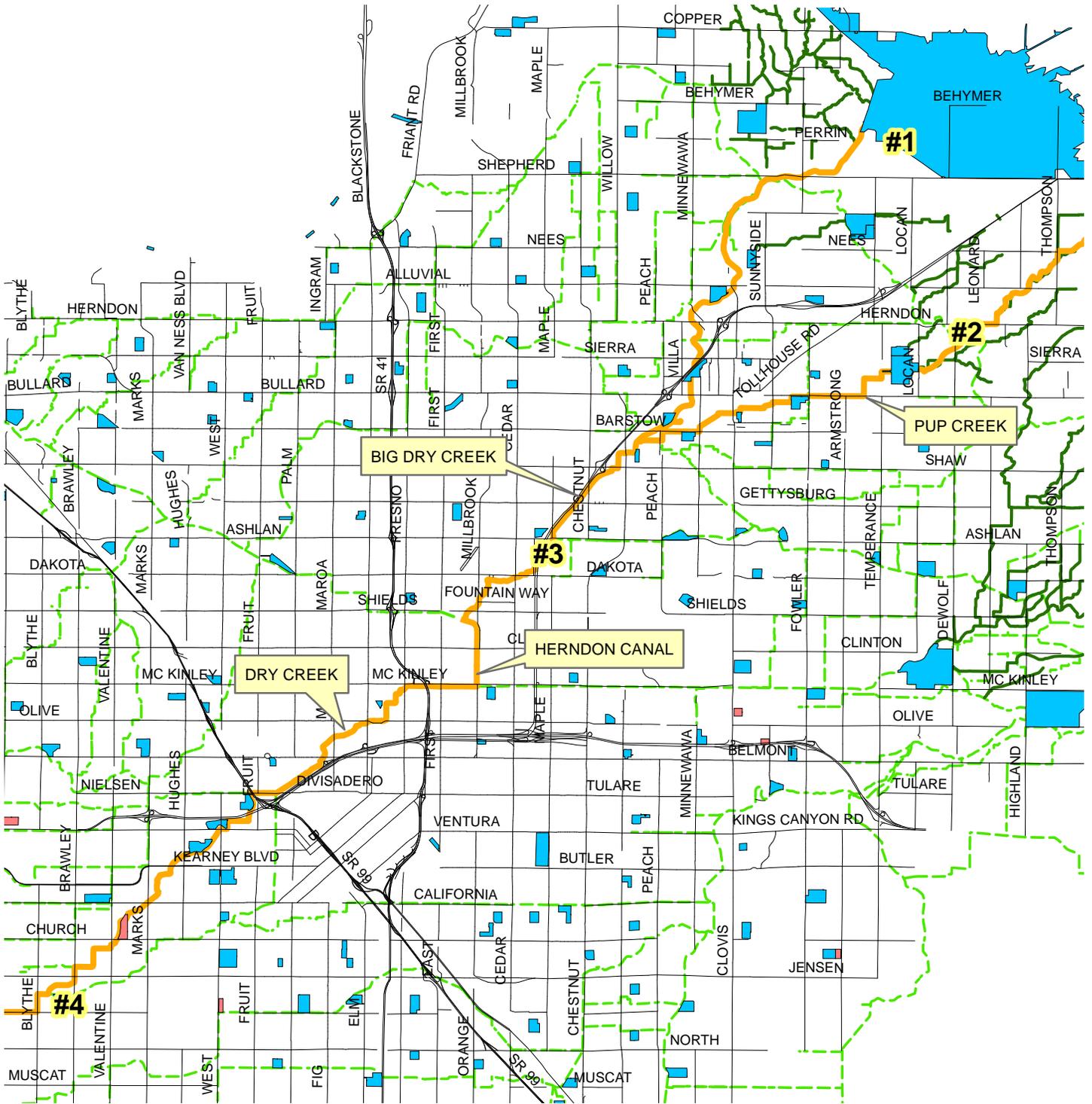
Figure 3-10 & 3-11 provides an illustration of the location of each component relative to the nearest SPFC facility.

¹Water Code Section 8523: The State and federal flood control works, lands, programs, plans, conditions, and mode of maintenance and operations of the Sacramento River Flood Control Project described in Section 8350 of the Water Code, and of flood control projects in the Sacramento River and San Joaquin River watersheds authorized pursuant to Article 2 (commencing with Section 12648) of Chapter 2 of Part 6 of Division 6 of the Water Code for which the board or the department has provided the assurances of nonfederal cooperation to the United States, which shall be updated by the department and compiled into a single document entitled "The State Plan of Flood Control."

²Water Code Section 12646(e): “Sacramento-San Joaquin Valley” means any lands in the bed or along or near the banks of the Sacramento River or San Joaquin River, or any of their tributaries or connected therewith, or upon any land adjacent thereto, or within any of the overflow basins thereof, or upon any land susceptible to overflow therefrom. The Sacramento-San Joaquin Valley does not include lands lying within the Tulare Lake basin, including the Kings River.

³California Water Plan Update 2009 defines the Tulare Lake Hydrologic Region “includes all of Kings and Tulare Counties and most of Fresno and Kern Counties.” (shown in Figure TL-1 in the CA Water Plan)

NOTE:
THIS MAP IS SCHEMATIC
DISTANCES ARE APPROXIMATE.



LEGEND

- Component **#1** Big Dry Creek Reservoir - Toe Drain / Seepage Remediation
- Component **#2** Pup Creek - Enterprise Detention Basin
- Component **#3** Big Dry Creek Detention Basin
- Component **#4** Dry Creek Extension Basin



Dry Creek Improvement Project Map

Project Map
Figure 3-14

Project	Explanation of Project relation to the SPFC and the Project's function with other stormwater conveyance systems	Geographic Location	O & M Liability
Dry Creek Flood Control Improvement Project	<p><u>Big Dry Creek Dam</u> This component to the Project is not part of the SPFC because it is located approximately 28 miles from the nearest SPFC Levees. The component's function is to control flows from the upper 81.7 mi² of Big Dry Creek and Dog Creek watersheds.</p>	<p>Latitude: 36° 52' 30" Longitude: 119° 39' 50"</p>	None
	<p><u>Pup Creek-Enterprise Detention Basin</u> This component is not part of the SPFC because it is located approximately 29 miles from the nearest SPFC Levees. The component's function is to attenuate flood flow from the Pup Creek watershed and divert flows between the Enterprise Canal and Pup Creek and for groundwater recharge purposes.</p>	<p>Latitude: 36° 50' 6" Longitude: 119° 38' 35"</p>	None
	<p><u>Big Dry Creek Detention Basin</u> This component is not part of the SPFC because it is located approximately 23 miles from the nearest SPFC Levees. This basin will continue service for 107 acres in drainage area to Freeway 168, provide stormwater storage for Drainage Area "C", attenuate flood flows from Big Dry Creek and/or the Gould Canal, and for groundwater recharge purposes.</p>	<p>Latitude: 36° 47' 28" Longitude: 119° 44' 46"</p>	None
	<p><u>Dry Creek Extension Basin</u> This component is not part of the SPFC because it is located approximately 18 miles from the nearest SPFC Levees. This component's function is to reduce flood flows from urban basins, divert flood flows from Big Dry Creek and Fanning Ditch, and for groundwater recharge.</p>	<p>Latitude: 36° 42' 4" Longitude: 119° 52' 1"</p>	None

Table 3-4: Project Specifics

Project Timing and Phasing

The proposed Project is not dependent on the implementation of other projects. The Project features will be operated in conjunction with the overall flood routing and management of the FMFCD flood control, since it will not be fully functional without subsequent projects. The Project contains several components that will be implemented in phases. Each component has stand-alone benefits; however, the overall Project is designed to maximize those benefits by integrating the operation and functioning of the components so they work together.

Phase of the Project are as follows:

Items	Start Date	Completion Date
<u>Completed</u> <i>Big Dry Creek Dam</i> – Installation of 36 piezometers	March 2009	June 2011
<i>Dry Creek Extension Basin</i> – Relocation of power pole, acquisition of 20 acres, excavation, Annadale abandonment, and drive gates	February 2012	January 2013
<u>Likely To Be Completed Prior To Grant Award</u> <i>Big Dry Creek Detention Basin</i> – Acquire 13.8 acres	October 2008	March 2013
<u>Phase I</u> <i>Big Dry Creek Dam</i> - Toe drain, two dewatering pumps at one location, and telemetry system	July 2014	September 2014
<i>Big Dry Creek Detention Basin</i> – Earthwork (Export 20,000 CY), base rock, and install perimeter fence	June 2014	October 2014
<i>Dry Creek Extension Basin</i> – Acquire 23 acres, pipeline Fanning Ditch, earthwork, outfall and intake structure with meter or measuring device, pump stand, base rock, lower Annadale roadway, and perimeter fence	June 2014	October 2014
<u>Phase II</u> <i>Pup Creek-Enterprise Detention Basin</i> – Construction of berm, concrete lined broad crested weir, and perimeter fence	June 2015	October 2015
<i>Big Dry Creek Detention Basin</i> – Construction of turnout structure with meter or measuring device, check structure, outfall, pipelines, pump station, 20,000 CY of soil to export, and telemetry system	June 2015	October 2015
<i>Dry Creek Extension Basin</i> - Construct a pump station, internal basin pipelines, outfalls, inlet, and telemetry system	May 2015	October 2015
<u>Phase III</u> <i>Big Dry Creek Detention Basin</i> – 20,000 CY of soil to export, landscape, and irrigation system		
<i>Pup Creek-Enterprise Detention Basin</i> – Construction of culverts under the Enterprise Canal, restore canal, turnout structure with meter or measuring device, pump station, recreational trail, base rock, export 32,200 CY (2014-2016) and wildlife observation pavilion	June 2016	October 2016

Table 3-5: Project Timing and Phasing

PROPOSED WORK

FMFCD proposes to consolidate subtasks into the grant defined tasks before entering into the grant contract.

The portion of eligible work that has already been completed and will be included as local cost share is identified in the budget plan, Attachment 4.

Category (a) Direct Project Administration Costs

Task 1: Administration

The work to be completed under this task will be performed by an FMFCD Project Manager with assistance from other FMFCD employees. The administration tasks will consist of managing the planning, environmental compliance, design, accounting; coordinating with DWR, including invoicing; and resolving any issues that arise. The FMFCD Project Manager will be responsible for coordinating FMFCD staff and consultants, USACE, DSOD, contractors, surveyors, and any others who are involved in preparing, constructing, and finalizing the Project through scheduled meetings, phone, and electronic mail.

Task 2: Labor Compliance Program

FMFCD will use the services of the State Department of Industrial Relations Compliance Monitoring Unit (CMU) to fulfill FMFCD’s labor compliance obligations under the grant. Per the CMU process, FMFCD and FMFCD’s prime and subcontractor(s) for the Project will register with the CMU web-based MyLCM program. Prime and subcontractors will enter payroll data per CMU requirements and be subject to monitoring and field compliance verification by CMU inspectors. FMFCD, as grant-recipient, will reimburse CMU from grant funds per CMU requirements and will, if requested, assist the Department of Industrial Relations with any enforcement actions taken against Project prime or subcontractors.

Task 3: Reporting

The FMFCD Project Manager will prepare and submit the Quarterly Progress, Final, and Post Completion reports to document the progress and the completion of the project, and the results from monitoring the improved sites. FMFCD will submit all reports to the State’s Project Manager per Proposition 1E Round 2 contract requirements.

Subtask 3.1: Quarterly Progress Reports

The quarterly reports will include an executive summary, report description of the Project operations to date, description of major accomplishments, discussion of any issues or concerns that may affect the schedule or budget, discussion of activities planned for the following quarter, cost, and schedule information. The quarterly reports will follow the outline specified in Exhibit E of the grant agreement and be reviewed by the Operational Engineer and the District Engineer to assure the report is concise and complete and contains all of the information specified in the grant agreement. Progress reports will also be presented to FMFCD’s Board of Directors, as well as the Technical Advisory Committee of the Fresno Area Regional GWMP and the Basin Advisory Panel of the Kings Basin IRWMP.

Following the completion of work on the dam to mitigate seepage, the USACE and DSOD will inspect the final product and after their approval, DSOD will provide FMFCD with a letter indicating all work is complete and a new Inspection of Dam and Reservoir in Certified Status certificate to permit operations/impoundment of stormwater in the reservoir consistent with those claimed in this application. Per request by the Division of Safety of Dam, FMFCD will submit to the Division of Safety of Dam, a copy of the As-built and Cost Affidavit. USACE will

provide a Letter of Completion for the installation of the toe drain and dewatering pumps. When the new certificate and letter is received, a copy will be submitted with the next quarterly report.

Subtask 3.2: Final Report

Upon completion of the Project, FMFCD will prepare and submit a final report that will include an executive summary, all final technical data, a map and shapefile(s) showing the location of the completed project, field notes, and an electronic copy of the record drawings. The final report will be a comprehensive document that will include a comparison of the planned schedule with the actual timeline, discussion of the major problems encountered, a summary of all costs, and a detailed description. The final report will be reviewed by the FMFCD Project Manager, the Operational Engineer and the District Engineer to assure the report is concise and complete and contains all of the information specified in the grant agreement. The final report will also, contain a certification of final project by a California Registered Civil Engineer that is consistent with Standard Condition D-15 “Final Inspections and Certification of Registered Civil Engineer.” Finally, a schedule for the Post Completion Report will be submitted with the report.

Following Project completion, FMFCD will monitor the total amount of stormwater runoff captured at the Big Dry Creek Dam, Pup Creek-Enterprise Detention Basin, Big Dry Creek Detention Basin, and Dry Creek Extension Basin, along with the amount of stormwater that is recharged at the three (3) basins.

Subtask 3.3: Post Completion Report

A Post Completion Report will be prepared and submitted annually for 10 years starting after the first operational year that the project is complete. The report will include a time period of the annual report, a short description and benefits, an assessment of any explanations for any differences between the expected versus actual project benefits, and a summary of any additional costs and/or benefits deriving from the Project since its completion.

Deliverables: Submission of Quarterly Progress, Final, and Post Completion Reports as specified in the Grant Agreement.

Report Submittals to DWR	Due Dates
Quarterly Progress Reports	Every 3 months from start of Project to completion
Final Report	After completion
Post Completion Report	Annually for 10 years after completion

Table 3-6: Report Submittals

Category (b) Land Purchase/Easement

FMFCD currently owns all of the land for Big Dry Creek Dam, Pup Creek-Enterprise Detention Basin, and twenty (20) acres of Dry Creek Extension Basin. FMFCD and the State are currently nearing completion of the purchase of approximately twenty-five (25) acres from the City of Fresno, Department of Aviation for the Big Dry Creek Detention Basin. The State is already

under contract with FMFCD to convey their purchase to FMFCD and grant funds are not requested for the portion of the basin acquired by the State. FMFCD is anticipating completion of land acquisition by March 2013. With respect to the easterly twenty-three (23)-acre parcel adjacent to the twenty (20) acres currently own by FMFCD for the Dry Creek Extension Basin, FMFCD is expecting execution of land acquisition by June 2014. A letter indicating willingness to sale the twenty-three (23) acres is attached as Appendix 3-17.

Deliverables: Copy of deeds for Land Acquisition for Big Dry Creek Detention Basin and the additional twenty-three (23) acres for Dry Creek Extension Basin.

Land Purchases	Due Dates
Big Dry Creek Detention Basin	March 2013
Dry Creek Extension Basin: 23 acres	June 2014

Table 3-7: Land Purchases

The portion of this task that has already been completed and will be included as local cost share:

Category (c) Planning/Design/Engineering/Environmental Documentation

Task 4: Assessment and Evaluation

Subtask 4.1: Data Collection and Seepage Analysis

From this Project, FMFCD will be able to determine the effectiveness of the toe drain installation by monitoring the groundwater piezometers and comparing new results with existing data. The groundwater readings will come from 36 piezometers located along the center of the dam and on the downstream side ranging from 15 to 60 feet from the toe of the earth dam. The amount of readings will vary and be based on the water surface elevation in the reservoir. With a low volume of water being stored behind the dam, FMFCD will start readings on a weekly base. As the water surface elevation behind the dam increases so will FMFCD’s monitoring and data collection. All data will be collected by a FMFCD Field Technician, reviewed and logged by a FMFCD Engineer. Any time the reservoir water surface elevation reaches 419.0 or higher, data will be delivered to FMFCD’s geotechnical consultant for seepage study and analysis. The geotechnical consultant will prepare a report with their study and findings and submit it to FMFCD. FMFCD will include the information in its reports to DWR.

The improvement to the three (3) proposed basin sites will serve to control and manage floodwater from Big Dry Creek, and Pup Creek, and provide improvements with flood routing in the canal system. Also, the District will utilize storm and surface water for groundwater recharge purposes.

FMFCD provides usage of its stormwater management basins in a local Groundwater Recharge Program. The City of Clovis, the City of Fresno, Fresno Irrigation District (FID) and FMFCD are all participants in a comprehensive groundwater management program. Each agency has an important role to help maximize the amount of surface water directed to basins for groundwater recharge purposes. The Cities of Fresno and Clovis each allocate a portion of their

surface water entitlement to be delivered to FMFCD basins via the FID canal system. FID delivers the water in accordance with authorizations from FMFCD.

FMFCD closely monitors its recharge basins in an effort to maximize its recharge capabilities. The following are some mechanisms that are used today and will continue to be used to monitor, and evaluate the recharge program.

Subtask 4.2: Stormwater Collection and Storage Reports

FMFCD has the capability of determining the volume of stormwater collected from particular storm events by documenting each basin’s water surface elevation before and after storms. With the use of the elevation-storage curve for each basin, FMFCD staff can calculate the volume of storm water that was collected in a storm event. Staff also has known percolation rates that can consider the amount of water recharge during the event. Further, FMFCD has several rain gauges throughout the system and with the precipitation data, it can identify the approximate return frequency of the storm event.

Subtask 4.3: Delivery Reports from the Fresno Irrigation District (FID)

Every month, FID provides a delivery report that lists the amount of surface water, in acre-feet, that was diverted to each FMFCD basin. This data is collected, logged and used to determine short-term (monthly) and long-term (yearly) surface water recharge trends of the various basins.

Yearly trends help staff evaluate the effects of siltation at a particular basin. Silt is removed from basins, on average, every five years. A declining yearly trend indicates siltation and the need for desilting.

Surface Water Recharge Model

Prior to each “recharge year”, FMFCD creates a surface water recharge model to predict volume of surface water that may be recharged at each FMFCD basin. The recharge year starts March 1 and ends February 28 of the following year, to coincide with FID’s delivery season and record keeping. The model considers the anticipated length of delivery season by FID (this varies by the water supply generated on the Kings River) and the work in FID’s or FMFCD’s systems that may interfere with water deliveries. Interferences may be canal maintenance (often intermittent during the year), construction activity either within the basin or pipeline collection system connected to the basin, basin maintenance schedules, or potential excavation at a basin. FMFCD staff also adjusts the percolation rate downward considering the cumulative siltation since the last maintenance work and restores the rate after the basin is maintained. Considering all of this information, FMFCD staff estimates the amount of recharge anticipated at each basin in a given year. The historical records of percolation rates at each basin are a resource for the estimates.

Recharge model numbers are used as a guideline. When actual delivery data varies greatly with those predicted by the model, FMFCD staff evaluate the discrepancy and determines the action

needed. It may be necessary to accelerate the silt removal schedule or repair the metering devices or measuring techniques of water delivery from FID.

Percolation Rate

FMFCD typically calculates percolation rates of its recharge basins following every field report or about every three (3) weeks between April and October. FMFCD has compiled a database of percolation rates conducted over the years and uses this data to model recharge efforts and determine the performance level of its basins. The amount of percolation is an actual measurement of the change in water level over a specific time period between measurements.

Telemetry System

FMFCD employs a telemetry system to monitor various conditions, including basin water level, at many basins where power is available. This system allows FMFCD staff to verify that appropriate water levels are maintained. It can also be used to determine percolation rates or rate of fall of water level when delivery is stopped.

The telemetry system is also useful in analyzing long term trends of the water level in a basin. This data can be exported to databases and spreadsheets where further calculations can be performed for further study. New telemetry capability is included at the Pup Creek-Enterprise Basin, the Big Dry Creek Detention Basin, and the Dry Creek Extension Basin under this grant request.

Subtask 4.4: Recharge Reports

FMFCD provides a semi-monthly report of the status of its recharge basins to the City of Fresno, City of Clovis, and the Fresno Irrigation District. The reports identify the observed water levels, the authorized water levels, the position of the control valves at the interties that divert surface water to the basins, and any comments about a particular basin. FID uses the report to address changes in routing the appropriate amount of water to recharge basins. Data provided by these reports is used to determine the efficiency of the surface water recharge program. Included is an example (Appendix 3-18) of a semi-monthly recharge report.

Stormwater Recharge Model

In addition to the surface recharge model, FMFCD also models stormwater recharge. This model is slightly different than its surface water delivery counterpart. It is used to estimate how much stormwater was recharged at each FMFCD basin, and collectively at all basins. Water level readings taken throughout the winter are used, along with basin capacity tables and known percolation rates, to estimate the amount of stormwater recharged.

Estimates provided by this model have reinforced past assumptions that surface water and stormwater recharge have a direct relationship. That is, heavy rainfall years typically reduce the time and capacity available in a basin for surface water recharge. Therefore, heavy rainfall years are, in many instances, followed by lesser surface water deliveries. Results from stormwater recharge models quantify stormwater recharge amounts and how they typically

offset subsequent lesser surface water recharge deliveries. In periods of limited rainfall, the reverse is true, less stormwater recharge, but greater volumes of imported water are recharged.

All of these mechanisms are funded by FMFCD as part of its ongoing operations and maintenance. However, the cities partially reimburse FMFCD for silt removal maintenance work related to the recharge program.

Upon completion of each facility of the grant, FMFCD will submit copies of the Stormwater Collection and Storage Reports, Delivery, and Recharge Reports quarterly prior to completion of the total Project and then annually post Project completion.

Deliverables: Submission of Stormwater Collection and Storage Reports, Delivery, and Recharge reports as specified in the Grant Agreement.

Assessment & Evaluation Submittals to DWR	Due Dates
Data Collection and Seepage Analysis	Every 3 months from completion of each facility to completion of total Project and then annually for 10 years after completion
Stormwater Collection and Storage Reports	Every 3 months from completion of each facility to completion of total Project and then annually for 10 years after completion
FID Delivery Report	Every 3 months from completion of each facility to completion of total Project and then annually for 10 years after completion
Recharge Report	Every 3 months from completion of each facility to completion of total Project and then annually for 10 years after completion

Table 3-8: Assessment and Evaluation Submittals

Task 5: Final Design

FMFCD has a well enacted process of completing plans and specifications for public works improvements that comply with competitive bidding and publicly awarded contract law. FMFCD uses both in-house staff and consultants to deliver project plans and specifications on schedule. All preliminary and final plans and specifications are reviewed by FMFCD staff prior to approval and bidding of the contract. Plans and specifications are also distributed to the appropriate public agencies and utility companies for review and coordination and signature approval when appropriate.

Big Dry Creek Dam

FMFCD’s consultant, BC&F, prepared and completed 90% Final Design plans and specifications for the construction of a toe drain and dewatering pumps. FMFCD will direct the consultant to complete the plans and schedule the work upon notice of the grant award and authorization to

proceed. Because groundwater is a cost factor at this location, the scheduling will attempt to be adjusted and timed to a period of low groundwater conditions.

Pup Creek-Enterprise Detention Basin

FMFCD has completed the Preliminary Basin Design. The fence plans and specifications have not been started, but will be completed by FMFCD’s Engineers. The berm design, broad crested weir and turnout structure with meter or measuring device, pump station and telemetry system, trail work, observation pavilion, and the culvert crossing under the Enterprise Canal plans and specifications have not been started but will be completed by FMFCD’s engineers or engineering consultants. Each of these features are similar to other projects completed by FMFCD in the past.

Big Dry Creek Detention Basin

FMFCD has completed the Preliminary Basin Design that generally serves as a preliminary design of the earthwork and fence improvements. The perimeter fence pad (only east side is remaining to be changed), fence and outfall structure, inlet structure, pump station, and telemetry plans and specifications have not been started but will be completed by FMFCD’s Engineers. The plans and specifications for the turnout and check structure (with meter or measuring device) from Big Dry Creek to Big Dry Creek Detention Basin have not started but will be completed by FMFCD’s engineering consultants.

Dry Creek Extension Basin

The Final Basin Design was completed by FMFCD. The plans and specifications for the fence, telemetry system, backup structure with baffle wall, two gate valves, outfall and intake structure with meter or measuring device, pump station, internal basin pipelines, lowering of Annadale roadway, and replacement of a portion of Fanning ditch to pipeline will be completed by FMFCD Engineers.

Deliverables: Completion and submission of project plans and specifications at the final level.

Design Submittals	90%	100%
<u>Completed</u>		
<i>Pup Creek-Enterprise Detention Basin – Basin design (Figure 3-3)</i>	Complete	March 2015
<i>Big Dry Creek Detention Basin – Basin design (Figure 3-4)</i>	Complete	March 2014
<i>Dry Creek Extension Basin – Basin design (Figure 3-5)</i>	Complete	January 2014
<u>Calendar Year 2014</u>		
<i>Big Dry Creek Dam - Toe drain and two dewatering pumps plans</i>	Complete	February 2013
<i>Big Dry Creek Detention Basin – Earthwork, base rock, and install perimeter fence</i>	December 2013	April 2014
<i>Dry Creek Extension Basin – Pipeline Fanning Canal, outfall and intake structure with flow meter, pump stand, perimeter fence, and earthwork</i>	August 2013	April 2014

Design Submittals	90%	100%
<u>Calendar Year 2015</u>		
<i>Pup Creek-Enterprise Detention Basin</i> – Construction of berm, concrete lined broad crested weir, excavation, and perimeter fence	November 2014	April 2015
<i>Big Dry Creek Detention Basin</i> – Construction of turnout structure with meter or measuring device, check structure, outfall, pipelines, pump station, and telemetry system	October 2014	April 2015
<i>Dry Creek Extension Basin</i> – Construct a pump station, internal basin pipelines, outfall, inlet, and telemetry	July 2014	March 2015
<u>Calendar Year 2016</u>		
<i>Pup Creek-Enterprise Detention Basin</i> – Construction of culverts under the Enterprise Canal, wildlife observation pavilion, pump station with telemetry system, and turnout structure with meter or measuring device	November 2015	July 2016
<i>Big Dry Creek Detention Basin</i> – Landscape, and irrigation (surface water) system	January 2016	April 2016

Table 3-9: Design Submittals

Task 6: Environmental Documentation

Big Dry Creek Dam

The FMFCD’s Board of Directors authorized an environmental consultant, URS, to provide CEQA services on October 24, 2012. Preliminary environmental analysis shows very minor, if any, effects on wildlife during the project construction since the area is well maintained and mostly free of vegetation. The possibility that a 401 or 404 permit is needed is very low because all work done will be within the dam structure and not within Waters of the US. Because the toe drain will have minimal environmental effect, an Environmental Impact Report is not necessary. A Mitigated Negative Declaration (MND) is required for the project because impacts can be mitigated. URS is currently preparing a MND and they are anticipating on having all CEQA documents completed August 2013.

Pup Creek-Enterprise Detention Basin

April 11, 2012, FMFCD completed the CEQA documents. The following environmental determinations were made:

- The Project will not have a significant effect on the environment.
- A Negative Declaration was prepared for the Project pursuant to the provisions of CEQA.
- Mitigation measures were made a condition of the approval of the Project.
- A mitigation reporting or monitoring plan was adopted for this Project.
- Findings were made pursuant to the provisions of CEQA.

The Notice of Determination (NOD) attached and referred to as Appendix 3-3 lists the environmental determinations.

Big Dry Creek Detention Basin

A Mitigated Negative Declaration (MND) was completed in August, 1993, by the California Department of Transportation and the following environmental determinations were made:

- The Project will not have a significant effect on the environment.
- A Negative Declaration was prepared for the Project pursuant to the provisions of CEQA.
- Mitigation measures were made a condition of the approval of the Project.
- Findings were made pursuant to the provisions of CEQA.

Because the MND was completed 20 years ago, in January 2013, FMFCD reviewed the Project and that found no additional affects will occur. A Notice of Exemption (NOE) was prepared and filed (See Appendix 3-4).

Dry Creek Extension Basin

On November 20, 2002 the FMFCD completed the CEQA documents for the 20 acre parcel. The following environmental determinations were made:

- The Project will not have a significant effect on the environment.
- A Mitigated Negative Declaration was prepared for the Project pursuant to the provisions of CEQA.
- Mitigation measures were made a condition of the approval of the Project.

The NOD is attached and referred to as Appendix 3-5 lists the environmental determinations on page 1.

For the additional 23 acres, FMFCD has started the CEQA work in January 2013 and plans for completion around May 2013. It is expected the environmental determinations will be similar to the 20 acre parcel.

Deliverables: Submission of approved and adopted CEQA documentations.

Environmental Documentation Submittals	Date
<i>Big Dry Creek Dam</i> Mitigated Negative Declaration for construction of toe drain	June 2013
<i>Pup Creek-Enterprise Detention Basin</i> Notice of Determination, and CEQA	Completed
<i>Big Dry Creek Detention Basin</i> MND, Notice of Exemption, and CEQA	Completed
<i>Dry Creek Extension Basin</i> For the 20 acre parcel: NOD, MND, CEQA For the 23 acre parcel: CEQA	Completed May 2013

Table 3-10: Environmental Documentation Submittals

Task 7: Permitting

Big Dry Creek Dam

FMFCD has preliminarily determined that the construction on Big Dry Creek Dam will not require a Nationwide Permit (404 Certifications) from USACE, or a 401 Water Quality Certification from the State of California Water Resources Control Board. However, it will require two letters from DSOD; a letter of approval for FMFCD to do the work and a letter of completion of the work.

Pup Creek-Enterprise Detention Basin

Construction in the basin and on the channel will require a Construction General Permit from the State Water Resources Control Board (SWRCB). Channel and culvert improvements to Pup Creek will require a permit from FID to work within FID’s easement and right-of-way. A Nationwide Permit (404 Certification from USACE) and a 401 Water Quality Certification from the State of California Water Resources Control Board may be required as well. If it is necessary, the FMFCD will acquire a Nationwide Permit (404 Certification from USACE) and a 401 Water Quality Certification from the State of California Water Resources Control Board prior to the start of construction.

Big Dry Creek Detention Basin

Construction of a diversion structure to divert water interchangeably from Big Dry Creek to the basin will require a permit from FID to work within FID’s easement and right-of-way.

FMFCD also anticipates permits from the City of Fresno and CalTrans regarding the pipeline alignment to Big Dry Creek.

Dry Creek Extension Basin

Replacement of a portion of Fanning Ditch to a pipeline will require a permit from FID to work within their easement and right-of-way.

Deliverables: Acquire permits for Section 401, Section 404, Construction General, and FID Permit. Also, acquire Approval to do Work Letter.

Permitting Submittals	Date
<i>Big Dry Creek Dam</i>	
Nationwide Permit (404 Certification) (USACE)	January 2014*
401 Water Quality Certification (USACE)	January 2014
Approval To Do Work Letter (DSOD)	February 2013
<i>Pup Creek-Enterprise Detention Basin</i>	
Construction General Permit (SWRCB)	June 2015
Permit to Work w/in Easement and R-O-W (FID)	June 2015
Nationwide Permit (404 Certification) (USACE)	June 2015*
401 Water Quality Certification (USACE)	June 2015*

Permitting Submittals	Date
<i>Big Dry Creek Detention Basin</i> Permit to Work w/in Easement and R-O-W (FID)	June 2015
<i>Dry Creek Extension Basin</i> Permit to Work w/in Easement and R-O-W (FID)	June 2015

* If required.

Table 3-11: Permitting Submittals

Category (d) Construction/Implementation

Task 8: Construction Contracting

Construction contracting for all of the Project’s components will begin once design is complete, with commencing bid solicitations. FMFCD staff will prepare construction contracts in compliance with public contracting code. The contract documents that will be prepared include contract specifications, special provisions, contract, bid forms, subcontractor lists, prevailing wage requirements, bond and insurance requirements, etc. Topography will be provided to determine the grading necessary to complete the final basin configuration. A pre-bid meeting will be conducted if it is necessary. The FMFCD will prepare and publish notice inviting bids, conduct bid opening, evaluate bids, and recommend the apparent lowest responsible bidder for award by its Board of Directors. FMFCD will conduct a pre-construction meeting with lowest responsible bidder, sub-contractors, FMFCD’s Environmental Department, and any other agencies involved in the project. A Notice to Proceed letter is then issued to the contractor. The Project will be awarded in multiple sequencing of contracts under the above described procedure.

Deliverables: Advertisement for bids, evaluation of bids, award contract, and pre-construction meeting.

Task 9: Construction

Subtask 9.1: Mobilization and Site Preparation

Prior to the start of construction, the location of all underground utilities will be identified through field survey (potholing) and the use of Underground Service Alert. Safety meetings will be arranged to make all parties aware of any potential hazards during construction.

Construction site entrances and exits will be established early in the mobilization phase to efficiently manage construction vehicle and equipment. Where necessary, aggregate and rumble strips will be installed to mitigate soil from leaving the construction site to public roads.

Site preparation will entail setting up of temporary staging areas for contractor equipment and material, contractor move in, clear and grub, dust control, dewatering, rough grading for access roads and temporary haul roads. Dust, erosion, and noise mitigation measures will be implemented to minimize adverse impacts to the neighboring community.

Subtask 9.2: Project Construction

The Project construction will consist of constructing a new toe drain at Big Dry Creek Dam, and basin improvements to Pup Creek-Enterprise Detention Basin, Big Dry Creek Detention Basin, and Dry Creek Extension Basin. Improvements are shown on Figures 3-2 through 3-5.

Big Dry Creek Dam

This component includes the installation of a toe drain 15 feet deep on the downstream side of the dam for an approximate length of 7,000 feet and dewatering pumps.

On the downstream side of the dam, near the existing toe, a 24-inch wide trench will be dug 10 to 15 feet deep and approximately 7,000 feet in length. The excess material will be stockpiled near the trench and used to improve the existing maintenance roadway. Geotextile fabric will be placed inside the trench to prevent the existing soil from migrating into the drainage fill. Prior to the placement of drainage fill, a 6 and 8 inch diameter perforated drain pipe will be placed at the bottom of the trench. The trench will be backfilled with drainage fill to the existing surface and connected to the existing toe drain. Approximately a two foot-thick layer of soil will then be placed on top of the trench.

Refer to Figure 3-12 for the cross section of the toe drain. FMFCD has included a significant cost related to dewatering to install the toe drain in the Project estimates. Groundwater most frequently encroaches into the bottom portion of the proposed toe drain. However, FMFCD will try to schedule the work at a time of low groundwater. The schedule reflects the earliest potential schedule. If groundwater rises in that time schedule, FMFCD will consult with DWR and determine if rescheduling is preferred.

Pup Creek-Enterprise Detention Basin

This component includes improving the conveyance beneath the Enterprise Canal with control features, constructing a turnout structure with a meter or measuring device, constructing a concrete lined broad crested weir, constructing an embankment around the basin, constructing a trail along the northerly embankment, constructing a recreational rest stop/shade structure/wildlife observation pavilion, maintenance dewatering pump station, small initial excavation, telemetry station, and perimeter fence.

A four (4) foot high berm will be constructed along the perimeter of the basin to provide immediate storage benefits. The construction of the berm consists of a 10 to 12 foot (top width) berm with a four (4) to one (1) side slope. The construction of the berm involves approximately 5,966 cubic yards of earthwork. As part of the grant the FMFCD will obtain another 32,670 cubic yards of material removal during the grant period through calendar year 2016. The remainder will be removed over time, at the expense of contractors desiring fill material. Excavation of the basin below grade will take place as material is removed. Initially the basin will have 50 acre-feet of capacity, but following full excavation, the basin will provide approximately 200 acre-feet of storage capacity.

In order to avoid multiple disturbances of the Enterprise Canal, three (3) 42 inch diameter reinforced concrete pipes with a concrete headwall will be installed at one time and the canal restored with lining. These culverts will replace the existing 18 inch diameter (siphon) culvert underneath the Enterprise Canal and will be capable to convey the peak 200 year flood flow of 162 cfs, the amount necessary to fully correct the flood routing model. The upstream end of two (2) culverts will be sealed with steel plates and the third one will have a restrictor plate installed on the opening to limit the flow to equal the flow of the existing 18" pipeline. This is necessary to assure that flooding downstream is not exacerbated until storage in the basin is matched to the detention volume in the basin. The plates will be removed as storage volume is developed in the basin. The existing concrete lining inside the Enterprise Canal will be removed prior to replacing the culvert and replaced after the new culverts are in place. The work must be timed to fit a short period of annual non-use by FID of the canal.

To improve flood routing flexibility and provide a means to convey surface water in the basin for recharge purposes, a standard FID turnout structure with a meter or measuring device and a 48" gate valve will be constructed to connect Enterprise Canal with Pup Creek-Enterprise Detention Basin.

A concrete lined broad crested weir with a crest length of 100 feet and a 30 inch diameter gate valve will be constructed as a safety spillway to pass flow safely without overtopping the berm. Also, approximately 3,690 lineal feet of a six (6) foot chain link fence will be installed at the perimeter of the basin. A 15 cfs pump station will be constructed to pass water downstream for release purposes and for use when basin maintenance is needed. After final excavation is accomplished the berm will be removed. Please refer to Figure 3-3.

Big Dry Creek Detention Basin

This component includes the construction of a turnout structure with a meter or measuring device, pump station with a telemetry system, outfall structure, drop inlet structure, earthwork, and the installation of perimeter landscaping and fencing.

Approximately 1,000 lineal feet of existing fence will be removed. Along the east side of the basin the existing ground will be filled to elevate it to match the levee around the City of Fresno's Leaky Acre ponds and provide a single basin slope and a level fence pad along the perimeter of the basin. Additionally, approximately 1,100 lineal feet of new six (6) foot chain link fence will be installed to provide adequate security.

To improve flood routing flexibility, a standard FID turnout structure with a meter or measuring device, and a complete pump station with a telemetry system will be constructed in the northeast corner of the basin to connect Big Dry Creek with Big Dry Creek Basin.

Along the top perimeter of the basin, grass and trees will be planted and a pump installed to extract surface water from the basin for landscape irrigation. There will also be a backup

connection to the municipal water system installed and used for short periods during basin floor maintenance.

Refer to Figure 3-4 for the basin improvements for Big Dry Creek Detention Basin.

Dry Creek Extension Basin

This element includes construction of a complete pump station and outfall and intake structure, installation of internal basin pipelines, construction of an FID standard backup structure with baffle wall and gate valves, replacement of a portion of Fanning Ditch with a pipeline, and the installation of a telemetry system and perimeter fence. The Fanning Ditch capacity between Dry Creek and the basin will be increased to 100 cfs with the replacement of the open ditch as a 60 inch diameter pipeline. The Fanning Ditch across the westerly 20 acres of the basin will be replaced from an open ditch to a 36 inch diameter pipeline.

To improve flood routing flexibility, one (1) large outfall and four (4) small outfall structures will be constructed inside the basin along with 2,100 lineal feet of concrete pipe to connect all outfall and inlet structures with each other. Two electrically powered pumps, 30 cfs and a 5 cfs capacities, and a telemetry system will be constructed at the northwest corner of the basin. A 48 inch diameter concrete pipe outfall will be installed from the Fanning Ditch to the basin outfall and used to move water into and out of the basin. A standpipe and trash rack will be constructed at the junction of Fanning Ditch and the outfall to the basin and it will also serve as the point of a smaller pipeline for the Fanning Ditch to the west.

In the direction of flow, the Fanning Ditch enters the proposed FMFCD's parcel at the northeast corner and runs along the north perimeter of the basin. The ditch is in pipeline along the easterly 23 acres and open channel westerly of the 23 acres. A standard FID backup structure with gate valves will be constructed at the northeast corner of the westerly 20 acres, and 608 feet of the open ditch will be replaced with a 36 inch diameter concrete pipe to allow a fence to be constructed on the property line and also to eliminate the hazard of failing an open channel into the sandy slope of the basin.

Drainage will be collected at the southwest corner of the basin, and connected to the internal pipelines in the basin to eliminate that source of erosion and collect the drainage.

A new chain like fence will be placed around the full perimeter of the basin with several locked access gates to secure the site.

Also, the current profile of the abandoned and approximately 12 foot-wide roadway of Annadale Avenue will be lowered to grades of the adjoining properties. The new roadway will have a base rock or other year-around traversable surface for ingress and egress of neighboring properties.

Refer to Figure 3-5 for the basin improvements for Dry Creek Extension Basin.

Subtask 9.3: Performance Testing and Demobilization

FMFCD, USACE, and DSOD will inspect construction work on the toe drain at Big Dry Creek dam to ensure compliance with design.

Prior to construction, shop drawings and submittals will be reviewed such as concrete mix design, rebar shop drawings, valves, gates, and appurtenant shop drawings. On-site testing will include taking concrete cylinders to verify strength. Construction inspectors will review material data sheets and product labels to verify supplied materials match those specified in the design documents. ASTM D1557 compaction test method will be used for all soil compaction.

The final construction subtask will include system integration of control systems and their automated components for maximizing stormwater runoff conservation. The system will be tested upon installation. Pump stations, dewatering pump, valves, gates, etc. will also be tested prior to contractor demobilization.

Contractor demobilization will occur after final inspection and completion of all punch list items that are identified during final walk through.

Category (e) Environmental Compliance/Mitigation/Enhancement

Task 10: Environmental Compliance/Mitigation/Enhancement

The final construction specifications will include environmental compliance measures as required by environmental documents and permits. During construction, FMFCD’s Construction Manager will coordinate with FMFCD’s Environmental Department to monitor any potential impacts to endangered species, protection or restoration of habitat, and mitigation measures identified in the Project. The two departments will ensure the contractor adheres to the required compliance measures. Any tree removal of non-native trees that may affect raptors will be scheduled to avoid raptor-nesting season.

Category (f) Construction Administration

Task 11: Construction Administration

FMFCD has a portion of its staff dedicated to construction management that administers numerous civil construction projects that total millions of dollars every year in conformance with the Public Contracting Code. The construction management staff will manage the Project construction contracts. Construction administration activities will include general preparation of construction documents, construction inspection, measurement and payments, contract change orders, schedule, daily reports, certifications and acceptance of furnished equipment and products, final inspection and approval of the Project, and a Notice of Completion prepared and recorded at the County Recorder’s office.