

SYSTEM-WIDE IMPROVEMENT FRAMEWORK LETTER OF INTENT ATTACHMENT

INTRODUCTION AND BACKGROUND

The American River Flood Control District (ARFCD) has prepared this System-Wide Improvement Framework (SWIF) Letter of Intent (LOI) for continued rehabilitation eligibility in the PL 84-99 Rehabilitation Program for the Dry Creek Levee System, Robla-Arcade Levee System, and American River North Levee System, while the ARFCD develops a SWIF. This attachment describes unacceptable levee system deficiencies and justification for how a system-wide approach will optimize flood risk reduction.

The U. S. Army Corps of Engineers (USACE) Sacramento District conducted a Routine Continuing Eligibility Inspection (CEI) in spring 2016, which identified several unacceptable items. At the present time, USACE has not issued an inspection report, but has provided the inspection data. Based on a review of this inspection data and discussions with USACE staff, an LOI is being submitted in anticipation of an unacceptable rating for each of the three systems. These systems underwent a Periodic CEI in 2010 and were all rated as Minimally Acceptable.

Section 2.0 of this attachment includes a description of the unacceptable items, progress on correction of these items, and interim actions being taken to reduce risk until items are corrected. Because a system's rating is determined by the lowest rating of one of its segments, it is not anticipated that the system ratings will improve without long-term solutions. The future SWIF will address both interim risk reduction measures and long term measures for correcting these unacceptable items.

1.0 LEVEE SYSTEM AND SEGMENT IDENTIFICATION AND DESCRIPTION

1.1 LEVEE SYSTEM AND SEGMENT IDENTIFICATION

The three levee systems, collectively referred to as the *ARFCD North Area systems*, covered by this LOI, and which will be included in the SWIF, are the:

ARFCD –Dry Creek Right Bank, (NLD System ID: 5205000391), herein referred to as the *Dry Creek Levee System*;

ARFCD - Dry Creek, NEMDC, Arcade Creek (NLD System ID: 5205000392), herein referred to as the *Robla-Arcade Levee System*; and

ARFCD - American River Right Bank, NEMDC (NLD System ID: 5205000393), herein referred to as the *American River North Levee System*.

The Dry Creek Levee System is comprised of one segment; the Robla-Arcade Levee System is comprised of three segments; and the American River North Levee System is comprised of four segments as described in the section below and Table 1.1.

Table 1.1 National Levee Database Levee System and Segment Identification				
Levee System Name and ID Number	NLD Segment Name and ID	NLD Segment ID Number	Latest Inspection Type & Date	Rating
ARFCD – Dry Creek Right Bank, Unit 11 NLD System ID: 5205000391	ARFCD – Unit 11, Dry Creek right bank (AR08)	5204000391	Routine CEI March 2016	MA
ARFCD – Dry Creek, NEMDC, Arcade Creek NLD System ID: 5205000392	ARFCD – Units 6 and 8, Dry Creek left bank (AR06)	5204000392	Routine CEI March 2016	U
	ARFCD – Unit 2 north, NEMDC above Arcade Creek (AR2A)	5204000395	Routine CEI March 2016	U
	ARFCD – Unit 7, Arcade Creek right bank (AR07)	520400396	Routine CEI March – April 2016	U
	Unit 8, Magpie Creek (Non-leveed Channel)	5204000389	Routine CEI March 2016	MA
ARFCD - American River Right Bank, NEMDC NLD System ID: 5205000393	ARFCD – Unit 1, Arcade Creek left bank (AR 01)	5204000398	Routine CEI April 2016	U
	ARFCD – Unit 2 south, NEMDC below Arcade Creek (AR2B)	5204000397	Routine CEI April 2016	U
	ARFCD – Unit 3, American River right bank (AR03)	5204000393	Routine CEI April 2016	U
	ARFCD – Units 9 and 10, American River right bank, NEMDC MA 10 and 11 (AR3B)	5204000390	Routine CEI April 2016	U
Notes: A = Acceptable; M = Minimally Acceptable; U = Unacceptable.				

1.2 SYSTEM AND SEGMENT DESCRIPTION AND CONSTRUCTION HISTORY

The ARFCD North Area systems are part of the Sacramento River Flood Control Project (SRFCP). They are comprised of eight levee segments with a total length of approximately 22.5 miles (see Plate 1). The CVFPB is the non-federal sponsor for ARFCD North Area systems. ARFCD is the local maintaining agency (LMA) for all of the segments in the ARFCD North Area systems. Table 1.2 presents a basic description of the levee systems and segments.

Construction of flood protection facilities in the Sacramento Valley began in the 1800s, when landowners built low levees to protect individual properties. Landowners eventually formed reclamation districts and constructed more substantial levees in the late 1800s. After the SRFCP was authorized in 1917, USACE began improving the levees and flood protection systems. Levees in the SRFCP generally met USACE project standards by the late 1940s.

The Dry Creek north levee is approximately 1.59 miles long and located along the right bank of Dry Creek. Unlike most levees in the Sacramento Valley, the Dry Creek north levee is of recent construction having been constructed in 1995 by SAFCA as part of the North Area Local Project. This work was subsequently authorized by Congress 1998. The downstream (western) boundary of this reach is located at the NEMDC stormwater pumping station embankment (station 7000+00). The upstream (eastern) boundary of this reach is located at the intersection of Rio Linda Boulevard (station 7085+58).

The Robla Creek south levee, also known as the Linda Creek levee in the USACE 1956 construction documents, and officially named Dry Creek Left Bank (South) Levee, is the left bank or south levee of Robla Creek, which is located within the Dry Creek floodway. The levee is approximately 2.3 miles in length. The downstream portion of Robla Creek south levee (Station 6000+00 to 6052+00) was originally constructed in the 1950s by the USACE. In the 1990s, the existing levee was raised and the landside slopes were reconstructed by SAFCA, at which time the levee was extended from Station 6052+00 to 6106+66 and at which point the levee ties into high ground and continues eastward to Dry Creek Road (Station 6118+20) along the Magpie Creek Diversion Channel. A short spur levee starting at Station 6052+00, approximately 0.3 miles in length, and oriented parallel to and directly north of Claire Avenue, was constructed as part of the 1950s project and remains a Project levee although its regional flood protection purpose was overcome by the improvements made in the 1990s. The Claire Avenue levee still provides local flood protection.

The NEMDC east levee in the Robla-Arcade Levee System was constructed in the 1950s by the USACE, and extends from the American River to Robla Creek. The NEMDC east levee from Robla Creek to Arcade Creek (Station 3055+86 to 3192+23) is 2.4 miles long. In the 1990s, the levee was raised and the waterside and landside slopes were reconstructed.

The Arcade Creek north levee was constructed in the 1950s by the USACE, and extends from its connection to the NEMDC east levee (Station 5000+00) upstream approximately 2 miles to Marysville Boulevard (Station 5112+43). Levee raises or floodwalls and corresponding embankment widening were constructed along the entire Arcade Creek north levee by SAFCA in the late 1990s. Specifically, a nearly continuous floodwall was constructed along the waterside edge of the levee crest between Stations 5075+00 and 5112+43 to meet FEMA freeboard requirements. Floodwall heights range between 1.3 and 6 feet above the levee embankment crest and slope with wall heights increasing upstream and tying into high ground at Marysville Boulevard. The Rio Linda Boulevard Bridge was raised after the 1986 flood event and SAFCA tied the levee into the bridge railings in 1996; the Norwood Avenue Bridge was subsequently raised. No closure structures are currently present at these crossings as they are elevated above the levee.

The Arcade Creek south levee was originally constructed by local forces in the early 1930s and extends from the NEMDC (Station 4000+00) upstream approximately 2 miles to Marysville Boulevard (Station 4110+00). In the 1990s, SAFCA raised the upstream levee crown and constructed a continuous floodwall along the waterside edge of the crest between Rio Linda Boulevard (station 4068+00, approximately) and Marysville Boulevard (station 4110+00). Floodwall heights range between 0.5 and 3.5 feet above the levee

embankment crest with wall heights increasing upstream and tying into high ground at Marysville Boulevard.

The NEMDC east levee in the American River North System was originally constructed by local forces in the early 1930s, and was improved in the 1950s by the USACE. The NEMDC east levee from Arcade Creek south levee to the American River north levee (Station 2986+49 to 3051+61) is approximately 1.2 miles long. In the 1990s, SAFCA raised the levee and reconstructed the waterside and landside slopes from approximately Station 3001+50 to 3051+61.

The American River north levee was originally constructed by local forces in the late 1800s and early 1900s and was subsequently improved by USACE in the mid-1900s as part of the Sacramento River Flood Control Project and the American River Flood Control Project. Beginning in 1998 and extending through the early 2000s, USACE installed significant lengths of cutoff wall in the levee as part of the American River Watershed Common Features Project. Most of the levee was constructed prior to construction of the Folsom Dam and is therefore, generally, setback from the channel. The federally authorized American River north levee extends from the NEMDC (Station 3000+00) upstream to approximately Claremont Rd, upstream of Arden Way (Station 3582+00). The most upstream portion of the American River north levee, from Arden Way to Claremont, approximately 3,400 feet, is currently being proposed for deauthorization by the USACE. Cutoff walls are present for almost the entire length of levee upstream of Cal Expo. While the original cutoff wall that was constructed left gaps at road crossings and utilities, those gaps have been subsequently improved by USACE. Following the historic 1986 flood, and under the direction of Congress, the USACE undertook a general investigation for reducing flood risk to the City of Sacramento. In 1996, the USACE ultimately recommended several incrementally justified elements that were common to the different plans the investigation developed. These "common features" included remediation of 24 miles of the American River north and south levees. The proposed remediation for the American River levees was subsequently expanded to include some levee raising, erosion protection, and additional seepage remediation. All of the remediation authorized in 1996, and subsequently augmented in 1999, has been constructed by the USACE.

An approved vegetation variance is currently not in place for the ARFCD North Area systems. Once the SWIF is underway, it will be determined if a variance is necessary. If needed, a vegetation variance will be applied for accordingly.

USACE and SAFCA are currently proposing additional improvements to the ARFCD North Area System as part of the USACE's general reevaluation of the USACE Common Features Project. These features have not yet been constructed. However, SAFCA intends on constructing improvements to a small portion of the NEMDC east levee in the American River North Levee System and both the north and south levees of Arcade Creek in 2017.

Table 1.2 Description of Levee Segments in the ARFCD North Area Levee Systems					
Levee System	NLD Segment ID	Description	River/Stream	Approx. Length*	USACE O&M Unit
Dry Creek	AR08	Dry Creek right (north) levee	Dry Creek	1.59 mi	8
Robla-Arcade	AR06	Dry Creek left (south) levee. Also known as the Robla Creek Levee	Dry/Robla Creek	2.3 mi	6 and 8
	AR2A	NEMDC east levee above Arcade Creek	NEMDC	2.4 mi	2 North
	AR07	Arcade Creek right (north) levee	Arcade Creek	2 mi	7
American River North	AR 01	Arcade Creek left (south) levee	Arcade Creek	2 mi	1
	AR2B	NEMDC east levee below Arcade Creek	NEMDC	1.2 mi	2 South
	AR03	American River right (north) levee	American River	11.02 mi	3
	AR3B	American River right (north) levee (upstream of Cal Expo)	American River		9 and 10
<p>Note Levee lengths vary from source to source. Lengths provided are based on recent SAFCA design efforts and represent the best available data.</p>					

1.3 USACE SYSTEM RISK CHARACTERIZATION

The USACE completed a screening level risk assessment for the Dry Creek Levee System in September 2012. The risk assessment found that the levee system protects a population at risk of 551 (day) and 844 (night), with a life loss estimate of 0 for overtopping breach and 2 for breach prior to overtopping. A Levee Safety Action Classification (LSAC) 4 for both prior to overtopping and overtopping levee breach was recommended and accepted by the Levee Senior Oversight Group (LSOG) at the USACE. An LSAC 4 indicates a low probability of inundation due to breach prior to overtopping combined with a low potential loss of life which results in a determination of low risk for the levee system. This was justified by historically good performance under loadings exceeding 75 percent of the levee height, loss of life estimated to be low to moderate, no significant infrastructure, and a low probability of overtopping (greater than 500 year). The population was considered to be aware of the levee and there is a good warning and evacuation plan.

The USACE completed a screening level risk assessment for the Robla-Arcade Levee System in September 2012. The risk assessment found that the levee system protects a population at risk of 15464 (day) and 23828 (night), with a life loss estimate of 58 for overtopping breach and 107 for breach prior to overtopping. A LSAC 2 for prior to overtopping and 3 for overtopping levee breach was recommended

and accepted by the Levee Senior Oversight Group (LSOG) at the USACE. The overall system was given an LSAC 2. An LSAC 2 indicates a high probability of inundation due to breach prior to overtopping combined with a significant potential loss of life which results in a determination of high risk for the levee system. This was justified by analysis which indicated high probability of poor performance due to underseepage, limited historical loading (between 25 and 60 percent), inadequate animal control program, loss of life and economic damages estimated to be significant, encroachments passing through the levee are often unpermitted and some are beyond their expected service life with no available maintenance records, and limited ability to maintain the levee within the railroad right-of-way. The probability of overtopping is low (greater than 500 year). The population was considered to be aware of the levee and a there is a good warning and evacuation plan.

The USACE completed a screening level risk assessment for the American River North Levee System in September 2012. The risk assessment found that the levee system protects a population at risk of 58558 (day) and 51380 (night), with a life loss estimate of 93 for overtopping breach and 163 for breach prior to overtopping. A LSAC 1 for both prior to overtopping and overtopping levee breach was recommended and accepted by the Levee Senior Oversight Group (LSOG) at the USACE. An LSAC 1 indicates a very high probability of inundation due to erosion caused breach prior to overtopping and overtopping breach combined with a significant potential loss of life which results in a determination of very high risk for the levee system. This was justified by historic erosion damage causing near levee failures, highly vulnerable soils to erosion, high velocity channel flows, limited adequate erosion protection, and loss of life and economic damages estimated to be significant. The population was considered to be aware of the levee and a there is a good warning and evacuation plan.

1.4 POPULATION AND AREA AT RISK

Available data from the USACE *American River Watershed Common Features General Reevaluation Report, Final Report December 2015* indicates that the ARFCD North Area System provides protection for a population of approximately 75,000 in the City and County of Sacramento, and approximately \$5 billion in damageable property for the 200-year event. For all of the systems, there is no residential use on the waterside of the levee; however, dense suburban sprawl is present adjacent to the landside levee toe for most of the levees with the exception of the Dry Creek north levee. Along Dry Creek north levee, landside of the levee is rural suburban development although for the majority of the levee it is not directly adjacent to the levee toe. Commercial and/or industrial development is present along the landside of the NEMDC east levee and the southern portion of the American River north levee. Recreational land uses are present on the waterside of the American River north levee.

2.0 DESCRIPTION OF UNACCEPTABLE ITEMS AND JUSTIFICATION OF SWIF

2.1 DESCRIPTION OF UNACCEPTABLE ITEMS

Based on a review of the USACE Routine CEI data, the USACE identified 176 unacceptable items in the ARFCD North Area system. None of these items are classified as those which could seriously impair functioning of the system. Table 2.1 provides a breakdown of the unacceptable items by system and segment.

Table 2.1 Summary of Unacceptable Items By Levee System and Segment			
Systems and Segments	UY	UI	Total Items
Dry Creek Levee system	4	0	4
ARFCD - Unit 12, Dry Creek right bank	4	0	4
Robla Arcade Levee System	28	35	63
ARFCD - Units 6 and 11, Dry Creek left bank	6	7	13
ARFCD - Unit 7, Arcade Creek right bank	16	20	36
ARFCD - Unit 2 north, NEMDC above Arcade Creek	4	8	12
ARFCD - Unit 8, Magpie Creek	2	0	2
American River North Levee System	58	51	109
ARFCD - Unit 1, Arcade Creek left bank	18	15	33
ARFCD - Unit 2 south, NEMDC below Arcade Creek	5	4	9
ARFCD - Unit 3, American R right bank	11	10	21
ARFCD - Units 9 and 10, MA 10 and 11	24	22	46
Total	90	86	176
Note: UY = Unacceptable Yellow = Unacceptable items not likely to prevent performance in next flood event. UI = Unacceptable Pink = Unacceptable item noted in past inspection report that has not been corrected within the established timeframe.			

Approximately one third of the 176 unacceptable items are vegetation related and another one-third are related to pipes. The remaining one-third are generally related to other encroachments such as utilities or fences, or are related to minor maintenance issues. Table 2.2 presents a detailed breakdown of the items rated as unacceptable by levee system and segment. While vegetation does not affect status in the Rehabilitation Program, it has been included in the table since it was identified as unacceptable in the inspection. The same is true for the Magpie Creek items as this is a non-leveed channel. The majority of the pipes rated as unacceptable are classified as unacceptable because they have not been video inspected. Other items were identified as unacceptable as permit documentation was not available for the encroachment.

Table 2.2 Unacceptable Items by Segment						
Systems and Segments	Veg		Pipes		Other	
	UY	UI	UY	UI	UY	UI
Dry Creek Levee system						
ARFCD - Unit 12, Dry Creek right bank	0	0	3	0	1	0
Robla Arcade Levee System						
ARFCD - Units 6 and 11, Dry Creek left bank	0	0	2	1	3	6
ARFCD - Unit 7, Arcade Creek right bank	10	0	12	6	4	4
ARFCD - Unit 2 north, NEMDC above Arcade Creek	0	1	1	0	3	7
ARFCD - Unit 8, Magpie Creek	1	0	0	0	2	0
American River North Levee System						
ARFCD - Unit 1, Arcade Creek left bank	0	11	11	2	7	2
ARFCD - Unit 2 south, NEMDC below Arcade Creek	1	3	3	0	1	1
ARFCD - Unit 3, American R right bank	2	7	5	2	4	1
ARFCD - Units 9 and 10, MA 10 and 11	2	18	15	3	7	1
TOTAL	20	40	52	14	32	22
Note: UY = Unacceptable Yellow = Unacceptable items not likely to prevent performance in next flood event. UI = Unacceptable Pink = Unacceptable item noted in past inspection report that has not been corrected within the established timeframe.						

Although the Routine CEI inspection results have not yet been officially published, ARFCD is already undertaking corrective action as part of its annual maintenance activities. These corrective actions are not tracked separately and there is no available cost information for repairs to date.

2.2 JUSTIFICATION OF SWIF APPROACH

ARFCD will take a worst-first, prioritized approach with the overall goal of correcting outstanding unacceptable items to bring the system into compliance with the project Operations and Maintenance (O&M) Manual in accordance with the assurances provided. That is, the intent is to restore the levee to USACE O&M standards with priority given to eligibility criteria identified in the Interim Policy (i.e., items listed in paragraph f.(3) and Enclosure 3 of the Interim Policy). However, some unacceptable items, particularly vegetation and inspection of pipes, will require a longer period to correct due to environmental constraints and permitting for impacts to listed species; and private property rights and enforcement.

ARFCD anticipates that it will take between ten and twenty-five years to address all the unacceptable items. As is the case for most of the Central Valley, the majority of unacceptable items identified during inspections is vegetation. This same vegetation provides habitat to threatened and endangered species regulated by local, state, and Federal agencies and therefore permission from the regulatory agencies to

remove is extremely difficult and, when allowed, costly due to the habitat compensation required. For example, an erosion protection project constructed in 2008 required the compensation for impacts of 22 elderberry shrubs, critical habitat for the special status valley elderberry longhorn beetle. This cost was \$287,000, in addition to the cost to transplant the shrubs. Another common example is a local municipality's requirement to protect and compensate for "heritage trees". An LMA removing 42 heritage trees in one county was required to pay a \$45,000 fee for their removal, in addition to the costs for the physical removal of the trees. Regionally, the cost to physically remove a single tree varies between \$1,000 and \$2,000 depending on the size, the number of trees, and if the trees are being hauled away by the contractor. Removal by the LMA also requires biological monitoring and environmental impact compensation in almost all cases.

Encroachment modification and removal in the Central Valley is less likely to impact special status species as they typically don't present habitat, but are subject to their own complexities due to their existence before adoption of the SRFCP, private property rights, and state enforcement proceedings. While encroachments are the responsibility of the individual owners, the LMA may need to research historical documents to determine if encroachments pre-date the adoption of the SRFCP and thus would not have permit documentation; determine if the encroachment is unpermitted and can be permitted; or if the encroachment is permitted but only has an incomplete record. In all cases, the LMA will coordinate with the owners, conduct research, facilitate permitting as appropriate, and/or notify owners of the need to modify or remove. It is anticipated that the owners will be reluctant and in some cases refuse to take the required actions. In those cases, the LMA will work with CVFPB to initiate enforcement proceedings. An LMA can expect to spend \$5,000 to \$20,000 to support individual owners with addressing their items. This range reflects minimum coordination to actual processing on behalf of the owner, but does not include any cost to modify or remove an encroachment, which would present additional cost.

Pipe penetrations are common along Central Valley levees and many predate the adoption of the SRFCP. USACE now requires video inspections of pipes and in most cases, this requirement was not in place at the time the pipe was installed. Video inspection costs range from \$2,000 - \$3,000 per pipe depending on access (i.e., physical access to the inside of the pipe). Due to the cost, and the fact that the requirement for the video inspection was not a condition of the permit, at least for those installed prior to the requirement, which is most, most pipe owners are unwilling to comply. In these cases, access to the pipes will be required and the inspection itself may interrupt operations, presenting challenges, especially for public penetrations supporting utilities. Several of the pipes are publically owned. For these pipes, willingness to inspect the pipes may be greater, but these inspection will require new budgeting and/or reprioritization of public funds. Therefore, regardless of the ownership status, getting all of the pipes video inspected will require a lengthy period of time. Resolution of pipe related items (i.e., obtaining video inspections) will require a specific plan of action as pipes are owned by utility companies, private landowners, and/or local government agencies.

Lastly, due to the specific climate of the Central Valley (i.e., rainy season from November to early April), O&M activities are generally performed on a standard, annual cycle. For example, due to the seasonal activity cycle of the ground squirrels, it works best to use pesticide smoke bombs in the spring when soil moisture helps contain the smoke, perform baiting and trapping during summer when squirrels are actively foraging, and grout all of the burrows immediately before flood season so that assurances are strong that any voids have been addressed prior to high water. Performing these activities on an annual cycle allows the LMA to maximize the effectiveness of their activities, and maximize the efficient use of assessments. Another example includes performing levee repairs during wet conditions. Because it typically rains from November to early April, the LMAs usually wait until after the rainy season to repair

rills, regrade slopes, or perform any significant earthwork. Wet conditions are problematic for performing construction activities due to less than optimal soil moisture content for compaction, slippery work surfaces that can promote hazards, and excessive rutting damage that can develop from heavy equipment.

A SWIF will outline a plan for addressing vegetation, pipes, and all other unacceptable items. The worst-first approach will optimize flood risk reduction by correcting areas of highest risk first to incrementally reduce overall flood risk. Because vegetation is not used for determining eligibility in the Rehabilitation Program, it will be given lower priority than encroachments, including pipe/penetrations. Non-vegetation related unacceptable items will be investigated and corrected based first on risk, then on ability to correct given environmental, legal, and funding challenges. As the inspection results show, and an independent inspection by ARFCD in cooperation with SAFCA indicate, there are no immediate threats to levee integrity.

It is important to highlight SAFCA's Levee Accreditation Project which will improve significant portions of the Arcade Creek levees. Unacceptable vegetation along the Arcade Creek levees may be addressed in the near future (as soon as 2017) due to their location within the construction footprint. For vegetation outside this footprint, ARFCD will conduct a hazard assessment as part of its SWIF to identify vegetation posing the greatest risk, and actions that can be taken in the near future to reduce this risk without jeopardizing sensitive species, as well as long term actions, some of which may require environmental clearances to implement. Additionally, as outlined in Section 4 below, ARFCD will implement Interim Risk Reduction Measures to reduce risk to the community while the SWIF is being implemented.

3.0 DEMONSTRATION OF FUNDING COMMITMENTS

To address the items discussed above, ARFCD will need to cover the additional costs associated with correcting these items. ARFCD has an annual O&M budget of \$1.25M, raised by a benefit assessment on properties in the District. This budget is used annually to address many of the on-going items associated with O&M of the levee system including erosion, embankment stability, rodent and burrowing animal control and abatement, visibility, access, and vegetation management. This budget also includes funding for the ARFCD General Manager, eight full-time staff members, an engineering consultant, outside legal counsel, and part-time or contract labor as needed. This team will be tasked with prioritizing all unacceptable items identified in the inspection with most items not vegetation or pipe related being addressed through routine maintenance activities. The team will also develop a strategy and worst-first prioritization of the vegetation and pipe related items that will require longer-term coordination and permitting activities.

In addition to the local funding, as described above, ARFCD will actively pursue available State grant funding programs including Flood System Repair Projects (FSRP) grants, Flood Emergency Response grants, the Deferred Maintenance Pipe Inspection Program, and will seek broader projects through the Central Valley Flood Protection North Delta – Lower Sacramento Regional Planning process. In the event that additional monies cannot be secured through State and/or Federal grants, the ARFCD will continue to address items through the California Water Code Section 8701. California Water Code Section 8701 provides the Central Valley Flood Protection Board, and its delegates, the authority for addressing unauthorized and nonconforming structures built in, or on, levees.

As discussed in the justification section, addressing vegetation and encroachments is complex and subject to many, many variables. The single greatest unknown is who will address these items. In some cases the LMA is the responsible party, however, for most encroachments, the responsible party will be another agency or a private citizen. Until the LMA can determine if the owner will address the item on their own accord, it is impossible to know if the LMA will need to address the item on behalf of the owner. To this end, an estimate to address these items is also impossible to develop. However, some effort can be estimated. For the subject levee systems, assistance to encroachment owners could range from \$235,000 to \$940,000. If the LMA must modify or remove the encroachments, or undertake enforcement proceedings with the CVFPB, this range will increase substantially. Assuming the ARFCD must remove all trees, a minimum cost of \$60,000 to \$120,000 can be expected. And if ARFCD has to perform all pipe video inspections at its own expense, it would range between \$180,000 and \$225,000. Operation and maintenance issues will be addressed using existing annual funds.

Since the 2016 CEI, ARFCD has started to address the unacceptable items including vegetation clearing and slope grading. In addition, ARFCD has also done some clean-up and improvements to drop inlets identified as unacceptable. The cost of this work was not tracked but was funded through the annual assessment.

4.0 INTERIM RISK REDUCTION MEASURES

ARFCD is currently implementing interim risk reduction measures and will prepare an Interim Risk Reduction Measures (IRRM) Plan as a part of the SWIF in accordance with USACE Engineering Construction Bulletin 2016-8. The IRRM Plan will include a risk communication plan that addresses the potential increased risk to life caused by items that require a long term solution, such as vegetation and pipes. It will also include measures to identify, monitor, and communicate specific locations where unacceptable items exist. Communication will occur with appropriate local officials, encroachment owners, and the public, as appropriate. The public will be notified of the inspection results upon completion and publication of the inspection report by the USACE, the timing of which is currently unknown. However, the first notification of inspection results occurred in October 2016 at the ARFCD Board of Director's meeting, during which this document was presented. Notification to the public is expected to be provided through an announcement on ARFCD's website and through an announcement in ARFCD's annual newsletter, which is mailed to all residents in their jurisdiction in the fall. Separate and specific outreach will be conducted with owners of unacceptable encroachments and vegetation.

In the meantime, ARFCD will continue close coordination with Sacramento County emergency managers to improve communication and evacuation planning and update emergency operations to address areas of increased interim risk. Specific to pipes, beginning in 2017, ARFCD will accompany both the City and County of Sacramento on their annual pipe inspections to gain a better understanding of the risk presented by these items. Doing so will enable the District to have a better understanding of "hotspots" in their systems that will require increased surveillance, particularly during the high water events. It should also be noted that both the City and County of Sacramento have undertaken efforts to video inspect all of their pipes. At this time it is unknown which specific pipes have been inspected, but this knowledge will be obtained as part of SWIF development. ARFCD also collaborates with DWR to host annual Flood Fight Training for District staff and regional partners. ARFCD holds abundant stores of sandbags, visqueen, geotextile fabric, and other necessary flood fight supplies at its warehouse. ARFCD also has two separate emergency rock rip rap stock piles totaling 6,000 tons and 9,000 tons respectively. Additionally, as part of routine maintenance activities, ARFCD will continue to implement specific actions to reduce risk while they

seek a SWIF. These actions include increased vegetation management, increased visual inspection and testing of pipes, and corrective permitting actions. Since the CEI was performed, several items have already been addressed through the following actions performed by the ARFCD:

Rodent Abatement –ARFCD has a four phase rodent abatement program. In early spring, the District deploys smoke cartridges in all visibly active rodent burrows. In late spring and early summer, the District maintains poison bait stations throughout the District and monitors them for activity and needed refilling. In summer and early fall, the District has an active live trapping program. Prior to flood season each year, the District utilizes its grout trailer to fill all of the rodent holes except those above buried rip rap or buried launchable rock. The District goes through roughly 10 to 15 pallets of 47lb concrete bags per year for its grouting operation.

Encroachment – ARFCD notifies landowners adjacent to the levee of levee standards and encroachment guidelines annually. District staff also drive through the system weekly looking for new damage or encroachments. Adjacent landowners are immediately notified and engaged to seek a correction to the damage or encroachment. If this initial coordination does not yield an immediate solution, the District is able to initiate a Notice of Violation through delegated authority from the CVFPB (i.e., via the Enforcement Authority Delegation Program). Fortunately, this has not been necessary for any new encroachments. The CVFPB Enforcement Authority Delegation Program is being considered as an avenue for addressing pre-existing encroachments.

Vegetation Control – ARFCD continues its annual grass and vegetation maintenance through mowing, trimming, hazardous tree removal, and stump removal. Each year the District contracts with the California Conservation Corps (CCC) to provide hand labor and line trimming along the fence-line at the landside levee toe. CCC crew members are also used to haul trimming debris up the slope for chipping on the levee crown.

Erosion Repairs – ARFCD repairs frequent and reoccurring erosion from foot traffic on the levee slopes. As this is an urban levee district, high foot traffic is a constant threat to levee sod and stability. Where possible, the District has improved levee ramps to deter foot traffic on slopes. The District also commissions an annual bank erosion survey along the waterline. This is done to identify any areas where erosion threatens the waterside berm or levee cross-section.

Access – ARFCD continues their annual improvements to their access roads including grading and gravel placement. In some locations, gravel or aggregate base was installed at the landside levee toe to establish a maintenance access path. Due to a lack of project real estate for sufficient vehicle access, this maintenance path is only 6-feet in width.

In addition to weekly inspections through the levee system, ARFCD conducts two formal levee inspections and collaborates with DWR on their two levee inspections. The DWR fall inspection is conducted immediately before flood season to identify if any issues or infractions are present and considers items noted in the spring inspection. The fall inspection is also the determining inspection for the District levee rating. The District's goal is to have all levee reaches in prime shape and free of any deficiencies prior to flood season.

The USACE levee screening identified the greatest risks as underseepage and erosion. These deficiencies are being addressed by the locally led SAFCA Levee Accreditation Project and the USACE's American River

Common Features Project. Correction of the unacceptable items are interim risk reduction measures while these greater risks are addressed through large structural projects.

5.0 INTERAGENCY COLLABORATION

In order to address the remaining items and develop the SWIF, ARFCD will collaborate with other local, State, and Federal agencies, local community groups, non-governmental organizations, and other stakeholders as interested. Implementation of the corrective actions will require collaborative planning with some or all of the following:

- USACE for levee standards, design, Section 404 and Section 408 permits, and continuing eligibility inspections.
- CVFPB for real property issues, permitting, compliance, and enforcement of illegal or non-compliant encroachments.
- U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), California Department of Fish & Wildlife (CDFW), and California State Historic Preservation Act (SHPO) for environmental and historical resource consultation.
- California Department of Water Resources (DWR) for funding, levee standards, coordination with State Plan of Flood Control, regional planning, and continuing eligibility inspections.
- Sacramento County for emergency operations and response, land use planning, funding and permitting.
- Sacramento Area Flood Control Agency (SAFCA) for regional planning and levee improvements.

Additionally, as part of the SWIF process, progress on SWIF milestones will be monitored and evaluated by USACE. Routine continuing eligibility inspections of the levee system would continue to be undertaken during SWIF development and implementation. USACE, DWR, CVFPB, and ARFCD will coordinate inspections during SWIF development and implementation to ensure milestones are being met.

6.0 ANTICIPATED PERMIT AND CONSULTATION REQUIREMENTS

ARFCD will be performing corrective actions to ensure operational adequacy of the levee system. In general, these corrective actions will consist of routine maintenance activities including mowing, spraying, baiting, and minor grading operations that would not be anticipated to impact special status species or habitat, primarily the valley elderberry longhorn beetle, giant garter snake, Swainson's Hawk, Delta Smelt, and/or Central Valley Chinook Salmon. For corrective actions that are beyond routine maintenance, activities that may impact sensitive species or habitat, or activities that require enforcement actions, the following permits may be required:

- CVFPB encroachment permits;
- USACE Section 408 permits;
- USACE Section 404 permits;
- National Environmental Policy Act (NEPA) analysis and documentation;
- NMFS, USFWS, CDFW Endangered Species Act consultation;
- California Section 1600 Streambed Alteration Agreements;
- California Section 401 Water Quality permit;
- California Environmental Quality Act (CEQA) analysis and documentation;

- National Pollution Discharge Elimination System (NPDES) permits; and
- Local grading and drainage permits.

Permitting of corrective actions will include coordination and/or consultation with several State and Federal agencies, including some of those mentioned previously in Section 5.0, as appropriate.

In addition to consultation under fish and wildlife protection authorities and other environmental regulations, encroachment permitting, removal, or modification will require significant consultation between ARFCD and CVFPB, as well as individual encroachment owners and landowners. The CVFPB is responsible for enforcing encroachment permit terms and conditions and has a process in place for such enforcement. It includes research of permit and as-built records, informal coordination with easement- and land-owners, noticing, and potentially public hearings. This process can take a significant amount of time and can become litigious. Furthermore, in some cases, encroachments pre-date the establishment of operations and maintenance regulations and/or are found in project as-builts.

7.0 COORDINATION WITH FEMA

The ARFCD North Area systems are not accredited by FEMA. These systems were decertified by the USACE in 2012 and 2013 following publication of the USACE's new certification procedures (EC 1110-2-6067). Accreditation by FEMA will not be an objective of the future SWIF.

8.0 CONCLUSION

Given the anticipated challenges related to private property rights, permitting, and costs to address unacceptable items, particularly vegetation and pipes, ARFCD respectfully requests that the Dry Creek Levee System, Robla-Arcade Levee System, and the American River North Levee System, retain active status in the PL 84-99 Program, while long term solutions for unacceptable items are developed and implemented, as part of the SWIF.

