



**US Army Corps  
of Engineers** ®  
Los Angeles District



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**SKUNK CREEK 1 LEVEE SYSTEM**  
**MARICOPA COUNTY, CALIFORNIA**  
**NLD SYSTEM ID # 3805020027**

**PERIODIC INSPECTION REPORT NO 1**  
**GENERALIZED EXECUTIVE SUMMARY**

**FINAL SYSTEM RATING: MINIMALLY ACCEPTABLE**  
**FINAL RATING DATE: JANUARY 28, 2014**

PERIODIC INSPECTION REPORT PREPARED BY URS GROUP, INC.  
FOR THE U.S. ARMY CORPS OF ENGINEERS, LOS ANGELES DISTRICT

SUBMITTED: JANUARY 2014  
INSPECTED: JUNE 4 AND 5, 2013

## EXECUTIVE SUMMARY

This Executive Summary provides an introduction to the periodic inspection (PI), an overview of the system, a summary of the major findings of the periodic inspection, and the overall rating for the system.

### 1.1 Scope and Purpose of this Periodic Inspection

The purpose of the Skunk Creek 1 (SK1) Levee System PI is to identify deficiencies that pose hazards to human life or property. The inspection is intended to identify the issues in order to facilitate future studies and associated repairs, as appropriate.

This assessment of the general condition of the levee system is based on available data and visual inspections. Detailed investigation and analysis involving hydrologic and hydraulic design, topographic mapping, subsurface investigations, testing, and detailed computational evaluations is beyond the scope of this levee system inspection.

### 1.2 System Summary

The SK1 Levee System is located in the City of Phoenix, Maricopa County, Arizona. The National Levee Database (NLD) depicts the SK1 Levee System (NLD System ID #3805020027) on the right bank of Skunk Creek in the vicinity of Interstate 17 (I-17, formerly known as Black Canyon Highway). It begins on the east side of the north-bound I-17 Frontage Road (NBFR) approximately 700 feet south of the Hayden-Rhodes Aqueduct, and ends about 2,200 feet downstream of the south-bound I-17 Frontage Road (SBFR) bridge over Skunk Creek (Station 79+86.09 to 169+69.62), for a total length of 9,243 feet (1.75 miles) measured along the levee and floodwall. Refer to Figure 1.1.

Skunk Creek flows under I-17 about 20 miles north of downtown Phoenix. Channelization of the natural creek in this area was required to convey the flow of Skunk Creek under the highway bridges and thus ensure conveyance of the Standard Project Flood (SPF) to Adobe Detention Basin. When constructed, the leveed area was almost uninhabited. Today, the SK1 Levee System provides flood risk management for residences in a portion of the City of Phoenix along Skunk Creek. The channelization consists of trapezoidal and rectangular channelization. The trapezoidal channelization consists of earthen levees with or without an excavation below the natural ground surface. Except for the upstream end of the levee, the trapezoidal channelization was constructed with stone (riprap) or grouted stone (grouted riprap) riverside slope protection, depending on the reach. The rectangular channelization consists of floodwalls and reinforced-concrete pavement (USACE, 1982B, 1985, 1997).

Construction of the levee improvements was completed by the U.S. Army Corps of Engineers (USACE) Los Angeles District in 1983. In 2008, the State of Arizona Department of Transportation (ADOT) reconstructed the bridges over Skunk Creek for I-17 and adjacent frontage roads

The SK1 Levee System is a part of the Phoenix, Arizona, and Vicinity Flood Damage Reduction Project, which was authorized by the Flood Control Act of 1965, 79 Statute 1073, Public Law 89-298, 89th Congress, 1st Session; approved on 27 October 1965 (USACE, 1985). The title of this statute is “An Act Authorizing the Construction, Repair, and Preservation of Certain Public Works on Rivers and Harbors for Navigation, Flood Control, and for Other Purposes”.

The levee system is owned, operated and maintained by The Flood Control District of Maricopa County (FCDMC). The SK1 Levee System was inspected in the field from approximately Station 80+00 to 169+00. FCDMC personnel accompanied the PI Team throughout the field inspection and provided useful comments and support.

### **1.3 Field Inspection and Summary of Major Deficiencies Found**

The SK1 Levee System was inspected on 4 and 5 June 2013. Each item on the levee system inspection checklists observed during the site inspection was rated “Unacceptable”, “Minimally Acceptable”, “Acceptable” or “Not Applicable”. During the periodic inspection of the system, several deficiencies (“Unacceptable” or “Minimally Acceptable” observations) were noted for which remedial actions are required. The following major deficiencies were noted during the periodic inspection of the project features:

- Levee Embankments
  - Encroachments: A side-drainage structure was constructed through the levee embankment and a water main was constructed under the levee embankment and flood damage reduction channel. FCDMC Permit 2007P103 for the work was not reviewed by the Los Angeles District prior to construction. A side-drainage structure was constructed through the floodwall and a sewer pipeline was installed. There is no permit for this side-drainage structure. FCDMC Permit L98-57 for the sewer pipeline was not reviewed by the Los Angeles District prior to construction. A high-pressure gas pipeline was installed under the levee embankment. FCDMC Permit 2000P309 for the work was not reviewed by the Los Angeles District prior to construction.

The side-drainage structures and their soil backfill could, if not properly designed and constructed, be the source of problems such as through-seepage and levee slope instability. In addition, if joints are not properly constructed, levee embankment soil could be carried into the side-drain pipes, water main or sewer pipeline and form a sinkhole. Because USACE did not review the permits applications, it has not been determined whether the improvements were designed or constructed properly.

Drawings are available in the FCDMC permit file to help assess these features; however, no design reports, calculations, specifications, or construction observation and testing reports available.

- Floodwalls
  - The upper part of the floodwall was found to be removed without USACE permit.
  - A monolith joint was damaged.

#### **1.4 Overall System Rating**

The Levee Safety Out-Brief Meeting was held on August 14, 2013. An engineering determination has concluded that the observed deficiencies would not prevent the system from performing as intended during the next significant runoff event. Therefore, the Levee Safety Officer (LSO), Los Angeles District, has determined the overall system rating of Skunk Creek 1 Levee System to be “Minimally Acceptable.”

A “Minimally Acceptable” system rating is where one or more items are rated as Minimally Acceptable or one or more items are rated as Unacceptable and engineering determination concludes that the Unacceptable items would not prevent the segment/system from performing as intended during the next significant runoff event.

The Local Sponsor will be notified of the overall rating of the levee system by letter with instructions to correct the “Unacceptable” rated items immediately, not to exceed two years, and to correct the “Minimally Acceptable” rated items so that they do not deteriorate further and become “Unacceptable.”

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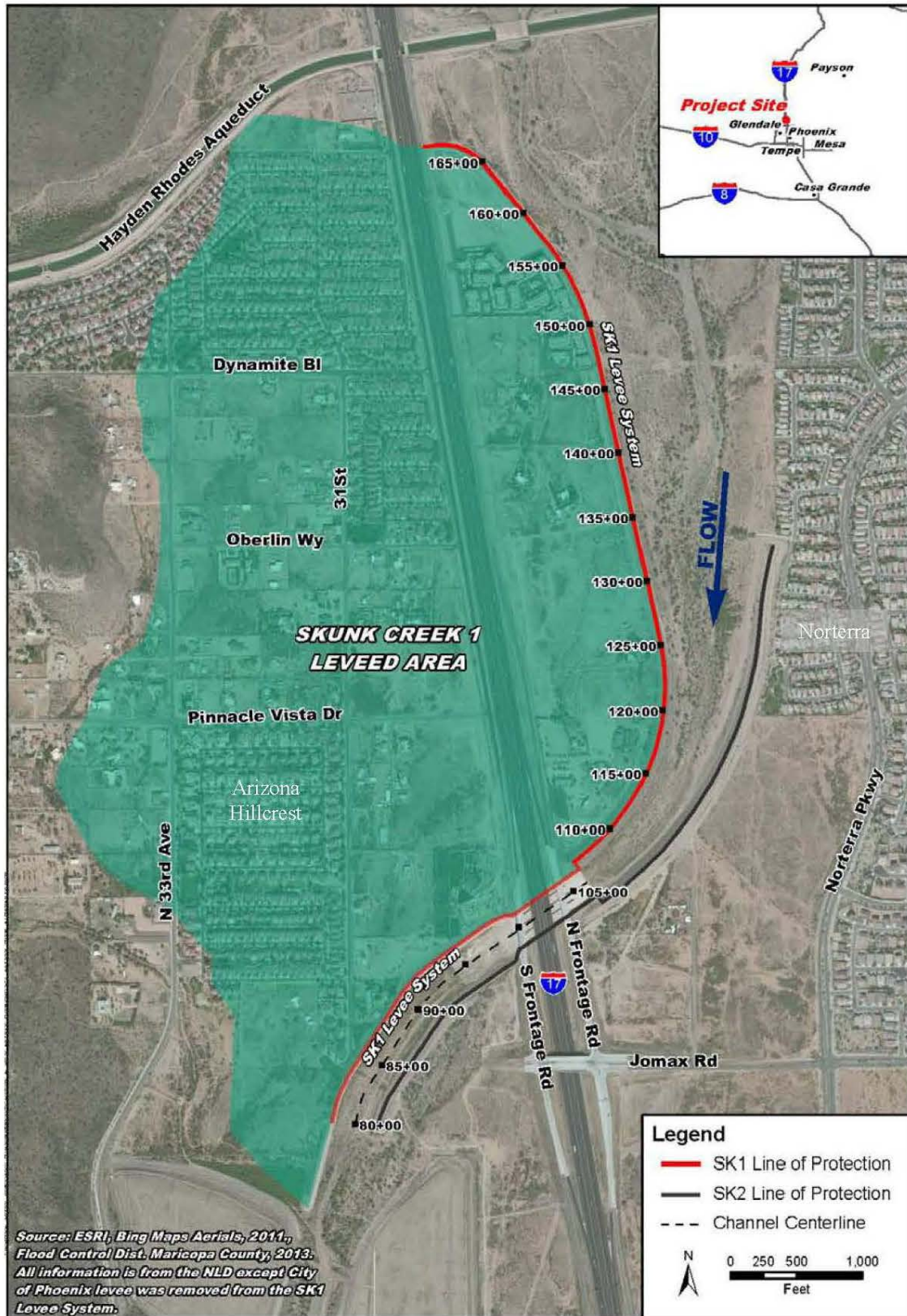


Figure 1: Skunk Creek 1 Levee System