ATTACHMENT 6

"MEASURES"

MONITORING, ASSESSMENT & PERFORMANCE MEASURES

Attachment 6
Monitoring, Assessment and Performance

The primary purpose of the Cactus Basin No. 3 is to provide improved flood control, protect human safety and to help alleviate stress on other storm water facilities located downstream in order to allow the regional flood control system to function more effectively. As a secondary purpose, Cactus Basin No. 3 has opportunities to provide ecosystem improvement to the Santa Ana Watershed Program.

The following are performance measures that will help facilitate the project performance verification process for the Cactus Basin Stormwater Flood Reduction project;

A. Reduce Flood risk

Figure 6-1

The main metrics that will be used to assess the projects performance are improved flood control and reduction of the 100-year, 6 hours floodwater levels over the one mile reach of the Rialto Channel conveyance system. The Floodwaters generated in the watershed will be conveyed by Cactus Basin No. 3 where it they be detained and released slowly through a basin outlet, therefore reducing the peak volume and depth conveyed through the streets, culverts and concrete channel reducing the potential for flooding. Floods are classified according to their frequency and depth. A 100-year flood event has a large enough volume and depth to cause severe damage and destruction, and is a serious threat to human safety. The Rialto Channel receives most of the storm runoff within the City of Rialto and is currently unable to handle the peak flow from 100 years-flood. Cactus Basin is located in a watershed producing 8,215 cubic feet per second and will serve to capture and detain approximately 15% or 1,244 cubic feet per second. Cactus Basin

No. 3 is part of the three Basin plan geared to capturing and reducing high volumes of floodwaters reaching residential, commercial and emergency service buildings. In order to quantify and track the performance of Cactus Basin 3, the District will incorporate a threefold method developed to successfully track the 119 basins currently located in San Bernardino County;

1. Monitoring- To monitor progress after completion of the project monitoring and measuring will occur during and after each major storm event, defined by the National Weather Service as having intensities of more than 0.3 inches per hour or more than 2.0 inches per 24 hours by the use of an ALERT system (Automated Local Evaluation in Real Time) and standard metrics. On site sensors, when installed, will monitor both rainfall and water levels in the basin and along the streambed. (see Figure 6-2)

   The data is then received, assessed, and archived by two independent computer base stations where it can used to assess project performance.

Figure 6-2

2. Inspection- Immediately after the storm season has passed, usually April, the inspectors begin Basin Inspections. Cactus Basin No. 3 Inspection will include structural assessment, security issues and overall basin status (i.e. erosion, excess vegetation, missing staff gage, graffiti). At minimum an inspection report with the required information above containing photos and the information shall be completed. (See Figure 6-3)

FLOOD CONTROL OPERATIONS DIVISION

BASIN INSPECTION REPORT

NAME OF BASIN: _____ DATE: _____

LOCATION: _____

FACILITY NO: _____ REACH: _____ INSPECTOR: _____

OBSERVATIONS

I. INLET WORKS

- ☐ a. Conduit
- ☐ b. Obstruction
- ☐ c. Growth of Vegetation
- ☐ d. Erosion
- ☐ e. Streambed Degradation along Toe Levee
- ☐ f. Changes in Flood Channel
- ☐ g. Inlet Gates Structure
- ☐ h. Equipment storage

II. BASIN

- ☐ a. High Water Elevation
- ☐ b. Debris
- ☐ c. Estimate of Silt
- ☐ d. Log Float
- ☐ e. Cross Walls
- ☐ f. Stop Logs
- ☐ g.
- ☐ h.
- ☐ i.

III. DAMS / LEVEES

- ☐ a. Erosion
- ☐ b. Rodents
- ☐ c. Cracking
- ☐ d. Settlement
- ☐ e. Growth of Vegetation
- ☐ f.
- ☐ g.
- ☐ h.
- ☐ i.

IV. SPILLWAYS

- ☐ a. Obstructions
- ☐ b. Growth of Vegetation
- ☐ c. Undermining
- ☐ d. Movement
- ☐ e. Wing Walls
- ☐ f. Condition of Concrete
- ☐ g. Settlement
- ☐ h. Condition of Riprap
- ☐ i.
- ☐ j.

V. BASIN DRAIN

- ☐ a. Head Gate
- ☐ b. Trash Rack
- ☐ c. Grease & Paint
- ☐ d. Conduit
- ☐ e. Obstructions
- ☐ f. Growth of Vegetation
- ☐ g. Condition of Concrete
- ☐ h. Settlement
- ☐ i. Structures
- ☐ j.

VI. GENERAL

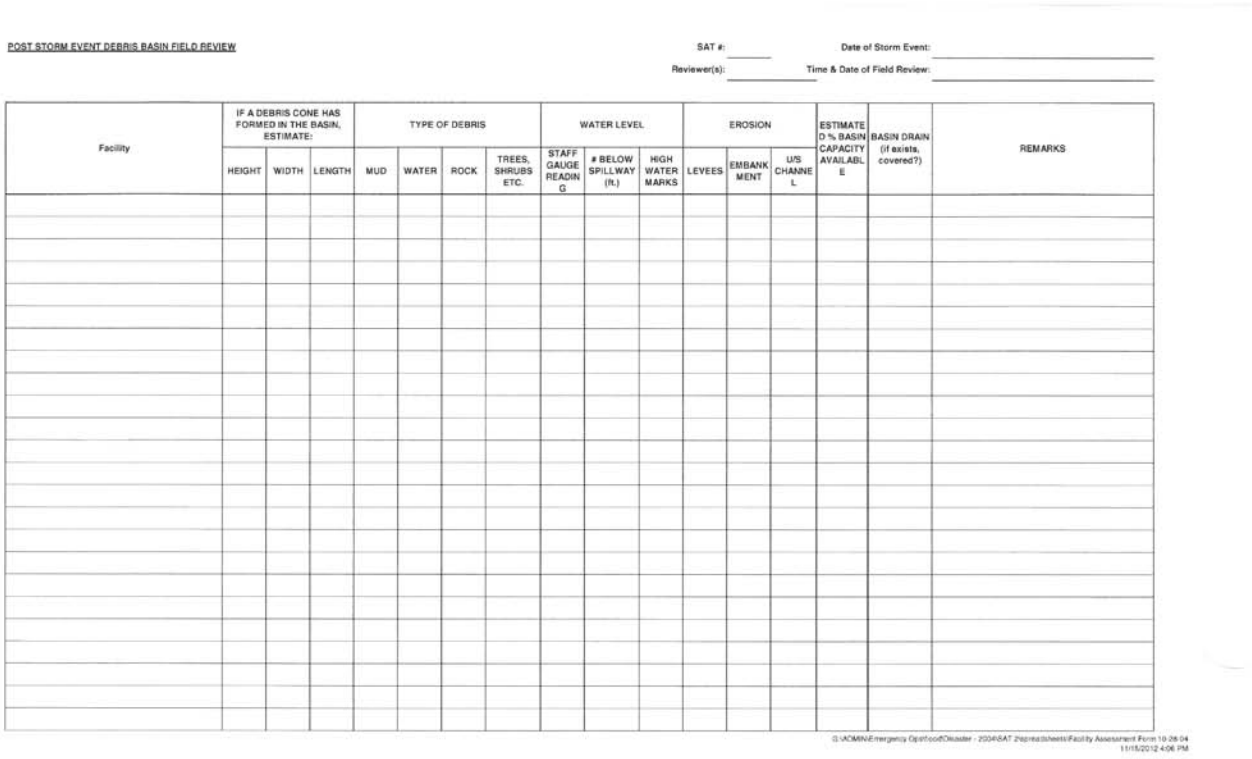
- ☐ a. Changes in Surroundings
- ☐ b. Changes Up or Downstream
- ☐ c. Encroachment on Right-of-Way
- ☐ d. Dumping
- ☐ e. Access Gates
- ☐ f. Access Roads
- ☐ g. Evidence of Trespassing
- ☐ h. Condition of fencing; guard rails
- ☐ i. "Keep Off" signs
- ☐ j.

Item No.	Inspection Comments	Item No.	Zone Supervisor Comments	Date Repaired

Completed By : Date:

Figure 6-3

3. Maintenance- The Operation Section of SBCFCD will assure the operation of the Cactus Basin 3 facility and will provide repairs as are feasible both before and during storm season. Prior to storm season field operations forces patrol the basins to determine and assure readiness of all systems to accommodate storm flow conditions. These responsibilities include inspecting head works and diversion works, control gates and overall basin cleanliness. In addition, they will insure that flood control basins are set to provide maximum flood control capacity, side drainage gates are debris free and checked for proper seating. Equipment and material are readied for use at debris accumulation and for each maintenance review as required above, an event debris report with photos shall be completed. At minimum the debris report shall included the information set forth below (see figure 6-4)



POST STORM EVENT DEBRIS BASIN FIELD REVIEW

SAT #: _____ Date of Storm Event: _____

Reviewer(s): _____ Time & Date of Field Review: _____

Facility	IF A DEBRIS CONE HAS FORMED IN THE BASIN, ESTIMATE:			TYPE OF DEBRIS				WATER LEVEL			EROSION			ESTIMATED % BASIN CAPACITY AVAILABLE	BASIN DRAIN (if exists, covered?)	REMARKS
	HEIGHT	WIDTH	LENGTH	MUD	WATER	ROCK	TREES, SHRUBS ETC.	STAFF GAUGE READING	# BELOW SPILLWAY (ft.)	HIGH WATER MARKS	LEVEES	EMBANKMENT	U/S CHANNEL			

G:\ADMIN\Emergency Op\Flood\Disaster - 2004\SAT Zip\Installsheets\Facility Assessment Form 10-26-04 11/15/2012 4:06 PM

Figure 6-4

B. Ecosystem Improvement

The proposed project for Cactus Basin No. 3 will require the removal of a vast majority of the existing vegetation located on-site. In order to mitigate this loss the SBCFCD will implement a two step process to ensure the habitat loss is mitigated. Vegetation will be replaced in part through on-site revegetation and by off-site preservation of 45 acres of similar upland habitat. First, SBCFCD shall place native duff (decaying vegetation) from stockpile and hydro seed with alluvial fan sage scrub seed mix in accordance with the approved Cactus Basin No. 3 Habitat Restoration/Revegetation Plan dated November of 2005. All disturbed areas inside the clearing and grubbing limits will be hydro seeded except for the basin floor and inlet, maintenance roads, revetted side slopes and Dam embankment. In addition, cutting will be installed and seeded over a 0.8-acre Habitat Restoration Area in Basin 3A to create new riparian vegetation to support mulefat scrub and riparian woodland. Secondly, pursuant to the 1988 EIR, the SBCFCD will preserve 45 acres off-site for the unavoidable loss to the alluvial fan sage scrub that could not be mitigated by any on site alternatives.

Project Performance Measures Table

	Project goals	Desired outcomes	Output indicators	Outcome indicators	Measurement tools and methods	Targets
(a) PRIMARY	Reduce Flood Risk	Reduce the percent chance of experiencing flood	Floodwaters stay within existing infrastructure	Reduced frequency of overtopping, road closures and maintenance	Monitoring, Annually Inspection and maintenance *(at min. annually)*	30-50% chance of experiencing flood damages
(b) SECONDARY	Ecosytem Improvement	1.) preserve 45 acres - offsite for alluvial fan sage scrub 2.) Revegetate 41 acres of native duff 3.) Provide Habitat Restoration	1.) SBCFCD agree to set aside 45 acres for mitigation prior to completion of project 2.) full restoration of alluvial fan scrub habitat after 5 years 3.) significant riparian plant growth present after 5 years	1.) 45 acres of land set aside offsite in its natural, undisturbed state in perpetuity 2.) attainment of between 30 and 50% relative cover by native alluvial fan scrub and greater than 40% bare ground 3.) riparian species	1) Weeds to be kept below 10% at all times. 2) Quarterly evaluations by Restoration Ecologist per the Habitat Restoration and Revegetation Plan	1.) Preserve 45 acres (offsite) for ecosystem restoration 2.) Revegetate 41 acres (onsite) of native duff 3.)Provide 0.8 acres (onsite) of riparian habitat