Report on Flooding Associated with Santa Catalina Mountains Watercourses on July 22-25, 2021

FINAL 11/2/2021

This post-flood report is based upon the observations, research and analysis of District staff, communications with Pima County Department of Transportation and reported observations from area residents.

Summary of the Storm and Flood Event

The storm event of July 22-25, 2021 was precipitated by a low pressure system near the Arizona-New Mexico border. It was a nearly identical weather pattern to the July 31, 2006 storm event, which caused historic flooding on a number of washes draining from the Santa Catalina Mountains. The 2021 event differed in that it resulted in more evenly distributed rainfall and lower rainfall amounts and/or lower rainfall intensities over the Santa Catalina Mountains.

From July 22 through 25, District ALERT rainfall gages measured an average of 2-4” of rain across nearly the entire Santa Catalina Mountains. Gages with rainfall totals exceeding 4” of rain over the entire report period are listed below, with rainfall over just the July 22-23 reporting period shown in parentheses.

- Park Tank gage 2020 (Tanque Verde watershed) – 4.41” (2.2”)
- Sabino Creek near Marshall Gulch gage 2290 – 4.25” (2.24”)
- Dan Saddle gage 1140 (Cañada del Oro watershed) – 7.72” (2.99”)
- Mt. Lemmon gage 1090 – 7.72” (2.13”)
- Ventana Canyon gage 1280 – 4.45” (2.28”)
- Ventana Canyon Wash at Sunrise Drive gage 2170 – 4.29” (1.97”)
- Finger Rock Ridge near Mt. Kimball gage 2260 – 5.47” (2.44”)
- Finger Rock Wash at Skyline Drive gage 2390 – 4.49” (2.8”)
- Pima Canyon near Table Mountain gage 2270 – 9.02” (4.76”)
- Pima Wash at Ina Road gage 1250 – 4.21” (2.44”)

Looking at the 24-hour Quantitative Precipitation Estimates from radar data for July 22 and July 23, it appears that the radar estimates may be low in some areas, but generally agree with gage data.

The Santa Catalina watersheds that were impacted significantly enough to warrant flood response staff investigating include: Cañada del Oro Wash, Finger Rock Wash, Geronimo Wash, Pima Wash, Pontatoc Wash, Sabino Creek, and a minor unnamed tributary watercourse. The most significantly impacted Santa Catalina Mountain watersheds, and the only watersheds with known flooded homes, were Finger Rock Wash and an unnamed tributary to Geronimo Wash.
Notably, despite flows in watersheds that were impacted by the Big Horn Fire, little or no debris was observed in flows below the national forest boundary except in Finger Rock Wash and Cañada del Oro Wash. Ash was observed in Pima Wash. The District’s University of Arizona research partners reported evidence of small scour and/or debris flow events within the national forest on a number of watersheds, including Pima, Finger Rock, and an unnamed tributary to Geronimo. These debris flows do not appear to have adversely impacted drainage infrastructure and did not apparently exacerbate flood hazards in developed areas. After an August 31, 2021 storm event, scour and/or debris flows were further observed in Cargodera, Ventana, Bird and Esperero watersheds as well as on the north side of Pusch Ridge, though it is not known when these events occurred. Scour and debris flow evidence expanded in Pima and the unnamed tributary to Geronimo Wash in August. No scour or debris flows were observed in the Cañada del Oro watershed.

The watershed response to the significant rains during this storm event, especially those impacted by the Bighorn Fire burn scar, was lower than expected by District and other agency staff, both in terms of runoff and debris flows. This may be in part due to the significant amount of vegetative regrowth that has been observed on the Bighorn Fire scar. It has also been postulated by District staff that floodplain models for some of the watersheds, Pima Wash being prime among them, may not accurately represent how they respond to extreme rainfall events. One possible explanation for the disparity is the presence of geological features such as fractures that promote the infiltration of storm water. The input parameters of future floodplain models of these watersheds may need to be adjusted to match observed watershed responses.

Finger Rock Wash Area

The most significant flooding issues, impacting numerous properties, occurred in two pulses. The first occurred in the overnight hours of Thursday, July 22. The second occurred in the overnight hours of Saturday, July 24. The July 22/23 storm was a 5-year event in the 3-hour duration at ALERT gage 2260 (Finger Rock Ridge near Mt. Kimball) and a 10-year event in the 1-hour and 3-hour durations at ALERT gage 2390 (Finger Rock Wash at Skyline Drive). Rainfall intensities for all subsequent rain between 7/23 and 7/25 were less than 1-year events.

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<th>Duration (hr)</th>
<th>2260 - Finger Rock Ridge near Mt. Kimball</th>
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<td>Storm Event: 7/22 to 7/23</td>
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Return period analysis for ALERT gage 2260 - Finger Rock Ridge near Mt. Kimball.
Impacts of the Flood Event

Where Finger Rock Wash crosses Columbus Boulevard, a portion of the flow traveled southeasterly down Havasu Road. This flow undercut a portion of Havasu Road. Based on resident accounts, it is the flow down Havasu Road that most directly impacted them in terms of water and mud entering garages and homes.

Water entered structures during the July 23 event. The largest number of impacted homes were in the Coronado Foothills Estates subdivision. During the July 23 event, approximately a dozen homes (6 confirmed) along Finger Rock Wash in the Coronado Foothills Estates subdivision were flooded and sewer and potable water service was lost in the area for more than a week following the event. Most of the home flooding was limited to garages, but water did seep into a number of homes. An assisted living facility at 4250 E Havasu Road had water seep into the home. The flood response team documented a high water mark on the outside of the home at 1.9 feet above grade. Fortunately, inquiries by District staff seem to indicate that most of the affected property owners had flood insurance.

One resident reported that 18-24” boulders were moving in the streambed during the flood.

Impacted residents asserted that when Pima County Department of Transportation (DOT) recently repaved the road, they raised the road profile through the dip section of Finger Rock Wash on Columbus Boulevard. Pima County DOT stated that the road work was only repaving and that the dip crossing was not raised as part of the road work. District staff on site during the July 23 flood noted that flow was already out of bank as it approached the Columbus Boulevard dip section. Based on this information, flood waters may have gone down Havasu Road regardless of the profile of the Columbus Boulevard crossing.
7 Photo looking upstream on Finger Rock Wash at Columbus Boulevard, showing flow going down Havasu Road on 7/25/21. (Source: RFCD)

8 Photo looking downstream on Finger Rock Wash at Columbus Boulevard, showing flow going down Havasu Road on 7/25/21. (Source: RFCD)
The owner of 4330 E Havasu Road requested assistance with clean up due to her advanced age and lack of financial resources to hire help. The Pima County Office of Emergency Management (OEM) enlisted the assistance of the volunteer group Team Rubicon to assist the property owner with clean-up efforts.

A storage shed at 4320 E Havasu had a high water debris line approximately 3 feet high and flood waters appear to have pushed the door in.

The flooding caused by the July 24/25 storm pulse was generally less severe than the event of July 23. No known home flooding occurred in this area as a result of the July 24/25 event.

Property owner accounts provided to the District are found in Appendix I.
11 District staff measuring a high water line of 1.4 feet on the home at 4330 E Havasu Road on 7/23/21. (Source: RFCD).

12 Property owner at 4230 E Havasu Road removing mud from garage and driveway on 7/23/21. (Source: RFCD)
District staff measuring a high water line of 1.9 feet on the home at 4250 E Havasu Road on 7/23/21. (Source: RFCD)

Debris line on home at 4320 E Havasu Road on 7/23/21. (Source: RFCD)
15 Damaged shed at 4320 E Havasu Road on 7/23/21. (Source: RFCD)

16 Motorist crossing Finger Rock Wash at Columbus Blvd. on 7/25/21. (Source: RFCD)
On both July 23 and July 25, flood response teams monitored the culvert on Finger Rock Wash under Skyline Drive for potential issues with the roadway. District staff visited this location multiple times during both events and observed that the culverts appeared to be open and functioning each time. On July 23, while a lot of debris collected on the upstream side of the culvert and approximately 12-15 feet of ponding occurred behind the road embankment, the culverts were always observed to be flowing and at no time did it appear that there was any risk to the integrity of the roadway. Based on observed debris, the backwater pool on the upstream side of Skyline Drive was about three feet below the road surface, at which point it would have overtopped. A wooden survey post was placed just to the northeast of the intersection at Columbus Boulevard and Skyline Drive to mark high water. The culverts under Skyline Drive are slated to be replaced with box culverts which allow the base flood to pass and will significantly reduce the risk to the road.

17 Ponded high water mark (red line) on Finger Rock Wash on the upstream side of Skyline Drive

Flows from Finger Rock Wash deposited a lot of sediment in the Sutton Lane area following the July 23 event. It did not appear that flow overtopped River Road.

The following buildings were reported to have flooded or may have flooded (as noted). It is likely that additional homes flooded that were not reported to or observed by the District. All items listed refer to the larger July 23 event.

- 4230 E Havasu (water barely entered residence via the garage, workshop on the property flooded, depth unknown)
- 4250 E Havasu (water seeped into this assisted living facility through the back door, where a high water mark of 1.9 feet was measured at the doorway)
- 4320 E Havasu (water in garage only)
- 4330 E Havasu (possibly flooded structure, high water mark measured at 1.4 feet on exterior wall)
- 4340 E Havasu (possibly flooded structure, high water mark measured at 1.5 feet on garage door)
- 6641 N Placita Arquilla (water in garage, high water mark 9” at front door, but not known if water entered the home) Note: This house flooded in the 1980s, during which flood waters were 2.5-3 feet deep.

The following high water marks were measured by District Staff. All items listed refer to the larger July 23 event.

- 4250 E Havasu - 1.9 feet measured at the back door
- 4330 E Havasu - 1.4 feet on exterior wall
- 4340 E Havasu - 1.5 feet on garage door
- 6641 N Placita Arquilla – 9” at front door
- 4142 E Coronado Drive – 4” of flow against house
- Sediment on Alvernon Road indicated that flow from Finger Rock Wash extended to the River Road intersection, a distance of about 1,200 feet
- Flow over Camino de la Bajada was 450 feet wide (paced distance)
Flow paths and other observations based on 10/8/2021 field meeting that included residents, RFCD and PCDOT
Publicly Maintained Drainage Infrastructure

No publicly maintained drainage infrastructure was damaged or impacted in Finger Rock Wash watershed. Pima County DOT reported that over the course of the storm, Columbus Blvd at the Finger Rock Wash dip crossing was damaged enough to require repair. The pavement was undercut on the downstream side of the roadway.

Post Flood Response

The District coordinated with the Pima County Office of Emergency Management to send multiple MyAlerts messages to the public, three of which were sent to residents around Finger Rock Wash. The first message, sent at 12:03 a.m. on July 23, was a general Catalina Foothills/Bighorn Fire flood message sent to all of Catalina Foothills area. The second message, sent at 12:48 a.m. on July 23, was specific to Finger Rock Wash and was sent in response to observed rainfall intensities in the Finger Rock Wash area. The third message, sent at 9:24 a.m. on July 25, was another message sent in response to observed rainfall intensities in the Finger Rock Wash area.

District flood response teams were sent to this area on Friday, July 23 and Sunday, July 25. On both occasions District staff spoke with numerous residents and provided recovery materials to them. Flooding during the July 25 event was less severe, so the primary focus of the flood response teams was monitoring flows and responding to victims of the July 23 event. District staff also visited locations of concern at the request of the ALERT coordinator, in particular where Finger Rock Wash passes under Skyline Drive via a culvert that is not currently designed to convey the 100-year discharge.

On August 4, District staff met with Jim Darling, HOA President for Coronado Foothills Estates and a number of residents of the subdivision to discuss possible drainage mitigation measures to reduce the risk of future flooding. No reasonably practicable solutions were found that were solely within the ability and control of the residents or the HOA. Pima County DOT indicated that when they fix the at-grade crossing on Columbus Boulevard, they are going to attempt to reduce the flooding risk. As noted earlier, flood waters were in the overbank approaching Columbus Boulevard, so it is not reasonable to assume that any modification of at-grade crossing could possibly prevent future flooding.

Pima Wash and Geronimo Wash Area

Based on data from ALERT gage 2270 (Pima Canyon near Table Mountain), the storm event of July 22/23 exceeded the 200-year return period. This gage registered approximately 4.5” of rain in a 3-hour period. The 200-year storm is 4.2” of rain in 3 hours and the 500-year storm is 4.84” of rain in 3 hours. Flow recorded on Pima Wash at gage 1250 (Pima Wash at Ina Road) was extremely peaky, rising from 451 cfs at 12:30 a.m. to the peak of 3467 cfs at around 1:00 a.m. and down to 709 cfs by 1:15 a.m. Based on a 3-hour storm, per the Big Horn Fire Post Burn Inundation Area study conducted by JE Fuller Hydrology in 2020, the 100-year discharge for Pima Wash is 4,550 cfs in pre-fire conditions and 5,319 cfs under post-fire conditions. The District’s Regulatory Discharge Table shows that the base flood (100-year) discharge of Pima Wash is 4,250 cfs at the confluence of Geronimo Wash and 5,300 cfs at the confluence with Rillito Creek. Flood stage exceeded 3 feet at gage 1250.

There was evidence of flow in Pima Wash at River Road on July 23, though it was not flowing as of 9:15 a.m. There was a high water mark of approximately seven feet on the upstream side of the box culverts under Christie Road. The owner at 425 E Deone Lane reported that the flow depth was approximately 4 feet in channel and got up to the driveway. Pima Wash was still flowing at this location at 10:30 a.m. A high water mark of 3.5 feet was observed on the west bank of Pima Wash on the downstream side of Rudasill Road. Pima Wash was still flowing at this location at 11:30 a.m. A high water mark of 6.5 feet was observed on the upstream side of the arch culverts on the south bank of Pima Wash at Barrel Cactus Drive.

The District doesn’t have any rainfall or stream flow gages in the Geronimo Wash watershed. Based on data from Rainlog.org, portions of the lower watershed area received approximately 2.8” of rain on July 22, 3.5” of rain from July
22-23 and 5-5.5” from July 22-25. The main impacts to property in this area were near the forest boundary. The 2.8” of rain on July 22 is a 5-10 return frequency for the 24-hour storm at the reporting location. Since Rainlog data is only reported on a daily basis, no determination could be made from the data regarding the intensity of lower return frequency storms.

Impacts of the Flood Event
Despite heavy rainfall and concerning stream gage measurements in the Pima Wash watershed, no flooded structures were observed or reported along Pima Wash. The reason for this may be that the event had a low volume due to the peaky nature of the flow.

The Pima Canyon Estates HOA reported that their unimproved at-grade access to a sewer lift station across Pima Wash was rendered impassable by the flood and would require significant work to restore. The HOA is seeking an alternate access to the lift station through the Pima Canyon Trailhead parking lot to avoid having to regain access via the at-grade crossing.

Review of the plans for the arch culvert design for Barrel Cactus Drive over Pima Wash revealed that the arch culverts are significantly blocked. The designs show that there should be six feet of clearance under the arch culverts. After this event, there is only about two feet of clearance. It seems that these culverts were largely blocked before this flood event, though it is not currently known how long the channel has been aggrading in this location or whether that aggradation was gradual or abrupt. These culverts are privately maintained.
Fencing at Park Place Apartments on Pima Wash upstream of Orange Grove Road were knocked over and damaged.

At least four homes in the Catalina Ridge Estates subdivision were impacted. The flood source was likely a tributary drainage of Geronimo Wash and flood severity may not have been exacerbated by the Bighorn Fire Scar. Ground mounted solar panels were partially damaged at 7571 N Cobblestone. It appears that flow left the primary channel at this property and flow travelled south, impacting several other properties, including the four properties in Catalina Ridge Estates.
22 Damaged solar panels at 7571 N Cobblestone Road on 7/23/21. (Source: RFCD)

23 Mud and debris against the garage doors at 3260 E Wind Song Place. (Source: RFCD)
24 Mud and high water mark at the front door at 3260 E Wind Song Place. (Source: RFCD)

25 Mud inside the garage at 3270 E Wind Song Place. (Source: RFCD)
The following buildings were reported or observed to have flooded. It is likely that additional homes flooded that were not reported to or observed by the District. All items listed refer to the larger July 23 event.

- 7440 N Catalina Ridge Drive (unknown whether water entered home)
- 3250 E Wind Song Place (several inches of water in home)
- 3260 E Wind Song Place (a few inches of mud in guest house)
- 3270 E Wind Song Place (several inches of water in home)

On July 25th, a flood response team observed possible roadway damage on Orange Grove Road at Geronimo Wash. This damage was reported to Pima County DOT to recommend they look at it for possible road closure.

Publicly Maintained Drainage Infrastructure
No publicly maintained drainage infrastructure was damaged or impacted in the Pima/Geronimo Wash area.

Post Flood Response
The District coordinated with the Pima County Office of Emergency Management to send several MyAlerts messages to the public, two of which were sent to residents around Pima Wash. The first message, sent at 12:03 a.m. on July 23, was a general Catalina Foothills/Bighorn Fire flood message sent to all of Catalina Foothills area. The second message, sent at 12:45 a.m. on July 23, was specific to Pima Wash and was sent in response to observed rainfall intensities in the Pima Wash area.

District flood response teams were sent to this area on Friday, July 23 and Sunday, July 25. Nothing actionable was observed on Pima Wash, though the Pima Canyon Estates HOA will be advised to perform maintenance on the culverts under Barrel Cactus Way.

District staff spoke with residents in the Cobblestone and Catalina Ridge Estates subdivisions and provided recovery materials to them. District staff also visited locations of concern at the request of the ALERT coordinator.

Cañada del Oro Wash Area
The ALERT gage on the Cañada del Oro Wash at Golder Road Bridge reached 1497 cfs at 8:17 a.m. on July 23.

Impacts of the Flood Event
Despite heavy rainfall and concerning stream gage measurements in the Pima Wash watershed, no flooded structures were observed or reported along Cañada del Oro Wash.

Maintenance Responsibilities
No publicly maintained drainage infrastructure was damaged or impacted in Cañada del Oro Wash watershed. The stilling well of a streamflow gage had to be cleaned out by District staff to restore functionality.

Post Flood Response
District flood response teams were sent to this area on Friday, July 23. Nothing actionable was observed.
Appendix I

The following information is direct reporting from residents of Coronado Foothills Estates. The content and statements are not those of Pima County Regional Flood Control District and the District makes no claim as to the accuracy of the statements.

The following is from an email dated October 20, 2021 from Marge Humphreys. It includes descriptions written by other property owners, as noted. Personal information has been removed. The name of the person writing the narrative has been kept when known in order to identify first-person narratives.

I asked each homeowner to provide a summary of "what was" and "what is" regarding damage and changes after the flooding. Didn't get a response from all, but since I am familiar with the properties, noted a few concerns.

[CONTENT OF EMAIL REMOVED]

Below are the responses/information in order of the location of the property:

4230 E Havasu

The homeowners at this property incurred damage to their garage and a portion of their home from muck and water coming down Havasu. The current design of the intersection of Havasu/Columbus allows water to flow down Havasu and into the home.

4250 E Havasu

Our home sits back off of Havasu road and has a long driveway that opens to a larger parking area on the west and south side of the home. The wash runs west on the lower part of the drive and on the west parking area. There is a 5 foot manhole centered in the wash directly across from the west parking area. When the first flood hit, the water from the wash entered the lower drive just above a small embankment that had been previously built. After the embankment, the water and debris came over the washes bank and flooded the entire west side of the house and south parking areas then flowed west onto our neighbors property. It rose 4 feet on the west side of the house with water and debris entering 2 doors. The kitchen and laundry room were flooded with water and mud. Piles of debris, mud and sand were deposited 4-5 feet on trees and covered the entire drive and parking areas. The water also flowed around to the south side to the front entry.

During the initial flood, the manhole was destroyed and a new manhole was put in stretching 9 foot across the wash and approximately 2 feet high. The west side of the wash was also built up with the excess dirt, boulders, and rocks from the excavation of the manhole. The manhole now served to act as a dam for future rains and along with the buildup of the west bank, the flow of the wash was altered, diverting its flow to enter our west driveway and home and travel through to the south driveway and into our neighbors home. Along with the initial flood, this created and reinforced a new pathway for the wash. While the manhole was revised down to 5 feet, it continues to dam the middle of the wash and has elevated the rocks and sand in the wash above its location. Now each time it rains (even a small rain) the manhole and bank blocks the natural flow of the water, builds up the sand base on its north side and overflows into our drive above the manhole. The ongoing destruction to the driveway has made it impassible to medical vehicles and visitors (approximately an 80sq ft hole).
In the 16 years we have been there, water has never overflowed the banks of the wash. Now EVERY rain large and small causes water and sand to be dumped into the driveway. With future potential for heavy rains and water flow, we are faced with ongoing flooding and significant damage not just to our home but those below us. As you are aware, this is an assisted living home. Daily access is paramount. The change in water flow and damming of the wash presents a significant risk to our home, business and to the lives of those who reside there. While we are aware that we are in a flood plain, we are also aware that the course of the wash has changed in no small part due to the barriers that have been introduced following the initial flood. We welcome your input, expertise, and shared responsibility in protecting our home and those seniors living there. Our neighborhood and community surrounding Finger Rock wash should be no less important than those living along the Rillito, Santa Cruz or Sabino washes which the county has taken great measures to protect.

Brent Pichler, M. Ed., NCCDP
Owner, Catalina Foothills Adult Care, Inc.

4260 E Havasu

The major flooding on July 23 was from the wash that breached the channel and flowed toward the house/garage area. Entered the garage and up to the outside of the kitchen wall. One more inch, and water would have entered. The second heavy rain repeated that scenario. Water now is also rushing to the southwest corner of the property and into the neighbor’s yard and enclosed pool area. Concern this will continue and cause additional damage to both house and neighbor's until the wash is diverted.

4270 E Havasu

Lots of damage to back yard including pool, AC unit, sewer main, patio walls and bricks. There’s additional deposits of silt on the exterior of the walls on the NW side of house and quite a lot of rubble from the broken down burnt adobe walls that need to hauled out of the area SE of the back patio.

I’d like to prevent repeated damage over the next several years in the event we have more heavy rains. The people from Pima County could maybe offer informed opinions about the placement of retaining walls, potentially installed outside the back patio walls on the NW side of the house. These would ideally be located between my house and patio and the O'Brien’s property and offer protection to my exterior AC unit and the walls to the patio and pool areas.

4300 E Havasu

Recap of how the Catalina Foothills Floods Affected Our Property

4300 E Havasu Road.

Prior to July 22nd/23rd, 2021, heavy rains did not dramatically affect our property. We have lived at 4300 E Havasu Road for since July 2008. Run off from heavy rains along Havasu Road would sometimes cause the first 5-10 feet of our driveway to flood and wash out the gravel at the front of our driveway. But two years ago we had put pavers at the front of the driveway to divert the water. Heavy rains would also cause the Finger Rock Wash at the back of our house to run periodically, but it was typically contained in the main channel of the wash, which lies about 60 feet from the back of our driveway. The wash was lower than our driveway and we
could walk out and step down into the main channel. Periodically, during very heavy rains, water might overrun that main channel and pool in the area between the main channel and our driveway, but it was never enough to cause concern.

On the night of July 22nd, our property was affected by flooding in three places. First, at the front of our driveway, heavy run off along Havasu Road washed out and dumped significant amounts of mud on the first 20 feet of our driveway. Pavers and gravel were washed down the street, and it required a Cat with a plow to make the driveway passable.

Second, the neighbor to our west experienced significant flooding and the collapse of outside walls. Not only did water and mud rush across the middle of our driveway and across our yard, but the water was of sufficient force to carry parts of her brick wall into my driveway and push boulders, parts of trees, and cacti through my yard and into the yard of my neighbor to the east. Again, the mud was so deep it took a Cat with a plow to make this section of the driveway passable.

Third, the most significant flooding came directly from Finger Rock Wash. At 12:30 am on July 22nd/23rd, I heard a roaring sound outside of my house. Hard flowing water filled the entire wash between my house and my neighbor’s house across the wash. The water was at least 4 to 5 foot deep. I observed 2-3 foot waves crashing against the brick wall that surrounded my backyard. The water ran swiftly down my driveway until it reached the front of my house and turned to the right covering my front walk and gardens and washing out my front yard. My garage filled with 2 feet of mud and water, to the point where water began to seep under the floor boards in the house. When I realized what was happening I was able to open the outside door to the garage and allow excess water to drain out of the garage to stop the flooding in the house. The water was sufficiently strong that it bent my metal garage door, pushing the door off its track. Cactus and large pieces of wood found their way into the garage.

The water rushing down the driveway filled the entire driveway but ran highest right alongside the house. The flooding deposited about a foot of sand and mud near the back of the driveway (closest to the wash), and created about an 8 inch mud/sandbar near the front walk. The flood deposited nearly a foot of mud and sand under the front windows of the house.

The biggest impact from the flood was in the back of the property, in what used to be a passive drainage area. Water not only ran fast in the main channel, but the flooding created a second channel that washed out the trees and bushes just to the north of the main channel. Water flowed rapidly alongside the wall that protected my backyard (and continued flowing that way for days), a path water had never taken since we have owned the house. Some of the water flow turned to the right, reconnecting with the main channel. But some of the water kept rushing through the yard behind my retaining wall, pushing boulders, tree stumps, and sandbags ahead of it. The debris knocked down a portion f a metal fence surrounding my side yard. The side yard, which at one time had contained an inground pool, was bricked in on e3 sides by a brick wall and the house. The entire area, including paved areas, filled up with 3 feet of mud, sand and water, with no place for the water to drain. The flooding also continued past my side yard and flooded the property of my neighbor to the east.

The flood on July 22nd/23rd broke my water line and severed my sewer line in the main channel of the wash, and the flooding in the side yard submerged my air conditioning unit under 3 feet of water. It took several weeks to discover the extent of the damage, but all three needed replacing.

On the night of August 16th, there was a second flood that occurred on our property. Leading up to this day a plumber and an excavator had dug trenches in the wash for replacing the water and sewer lines, and they were literally one day away from completion. However a heavy rainstorm overnight brought more flooding, sand, and debris down the wash. All the trenches were covered up from the amount of soil that was carried by the
water. More than a foot of new sand was deposited on my driveway. Because I had sandbagged the garage from the inside, there was no flooding in the garage, but there was significant amount of new sediment deposited on the driveway.

In the wash area, water ran alongside the wall surrounding my back yard for days. Once again, boulders and debris carried by the water pushed through the passive wash, knocked down (for a second time) the metal fence protecting my side yard filling the area up with another foot of mud, sand, and water. The water flowed alongside my property and into the yard of my neighbor (to the east) for days. To stop the flow of debris and water into my side yard and into my neighbor’s yard, I (with help from the excavator who was working on my plumbing repairs, and a contractor working for TEP) constructed walls of boulders at two points in the wash; one to try and divert water back toward the main channel of the wash and away from the wall protecting my back yard, and another to prevent debris and water from running into my side yard and into my neighbor’s property. These piles of boulders slowed, but did not stop, the water from running alongside the brick wall surrounding my back yard and running down my driveway.

One thing that is obvious after these two floods is that the sand / soil level in the wash is much higher than it was previous to July 22nd. Because the main channel of the wash has filled with sand and silt, the wash is now level, or slightly higher, than other points of my property along the back of my property. This is new and allows water to flow 60-70 feet closer to my house than previously, potentially eroding the soil and footings of the wall protecting my backyard, and creating a risk to constant flooding down my driveway (which threatens my garage and my front yard).

**4320 E Havasu**

My property was hit by rolling muck, water and debris both in front (down Havasu) and the back where the wash is located. I awoke to muck in my garage (almost entering my home), 5" outside garage door, muck under the front door and also muck in my screened in porch in the back. The culvert at the top of my driveway was completely full, and boulders along the shoulder of Havasu were moved causing a 4' drop compromising the road itself. My retaining wall (for circular driveway) was completely destroyed and the wrought iron fence left either hanging or washed away. Along with the muck was debris including logs that obviously were from the mountain. The water and debris managed to go over a 3’ wall with wrought iron on top into my grass yard. So far I have had 13 dump trucks of muck removed as well as a 40 yd dumpster of debris. More needs to be hauled away. Most of my landscaped cactus including large golden barrels were lost because of suffocation. Except for plants and pots very close to the house, all landscaping and "yard art" was lost. Soon after the initial flooding we had another storm which brought in more mud.

My concern: The wash not only moved from the original main channel and now much closer to my home, but also is 2 - 3 feet higher than before which is an additional concern. The secondary wash, also 2 - 3 higher, has become the main channel. From Havasu, the water runs down through a culvert (fortunately now open) under my driveway and through another culvert continuing along side my house on the south side. From there it previously joined a secondary wash and finally into the main channel. Now, however, when the water flows in that direction, and with the new wash channel closer, it flows back toward my house where they meet in a whirlpool.

In my 40 plus years of living here, I have never had a problem. I understand that this was the "perfect storm" with the Big Horn fire followed by monsoons, but the main channel of the wash has moved and any rain, light or heavy, produces flooding. A domino effect starts at the wash behind the home at 4250. As it travels south, the wash now flows closer and closer to each home.
I am hopeful that a new design at the intersection of Havasu and Columbus will prevent water from flowing down Havasu into the front of my property. Lastly, how do we protect our water and gas lines?

4330 E Havasu

July 23, 2021 FLASH FLOOD REPORT

Enid Whittaker

The flash flood of July 23rd 2021 broke down the berm between Marge Humphrey’s property and mine. Two feet of raging mucky water surrounded the entire house leaving between 2 and 18 inches of muck and debris throughout the property including the pool deck.

The fencing/gate surrounding the pool was displaced about 18 inches so that it no longer closes.

The protection surrounding the Tuff Shed underside was breached and the lower border damaged.

All 7 house doors were breached and will need to be replaced. 5 are PELLA sliding doors. Carpet throughout the house will need to be replaced.

The sliding pool cover was moved 10 inches leaving a foot of muck on the cover and 3 feet of muck in the pool. It was shoveled out by hand. The pool will need to be replastered and some of the pool cover hardware repaired and/or replaced.

One part of the berm on the back side of the property next to the wash was wiped out. Old gas lines in the wash caught debris preventing and diverting the flow onto the property. At other portions some was washed out so that the protection is not as thick as it was. Neither did they restore the drain that went from the low point at the bottom of the drive underneath to the other side drainage area.

On the street side water and debris washed out the drive. This was due, in part, to the SW gas company not building back the hump at the top of the drive to its original height and slant.

5 out of 8 heavy flower pots along the front side of the house were swept away and have been not recovered.