



How do I remove my home or property from a FEMA mapped floodplain?

I. Introduction

This document is intended to help property owners in Pima County, including property owners in unincorporated areas and in the incorporated communities of Marana, Oro Valley, Sahuarita, South Tucson, and Tucson. While the information in this document is based on highly technical information, this document is meant to help you determine if your residence or property can be officially removed from a Special Flood Hazard Area (SFHA). If you have difficult time understanding the information in this document or the steps you must take to determine if your property can be removed from an SFHA, or if you wish to install drainage improvements, you should contact your local Floodplain Management Agency. Contact information for your community is located on the last page of this document.

A list of acronyms you will find in this document appears below:

BFE	Base Flood Elevation
eLOMA	Electronic Letter of Map Amendment
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
LOMA:	Letter of Map Amendment
LOMC	Letter of Map Change
LOMR	Letter of Map Revision
LOMR-F	Letter of Map Revision-Fill
NFIP	National Flood Insurance Program
SFHA	Special Flood Hazard Area

If your property is in an SFHA, you will find the flood zone designation on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs).

An SFHA is a high-risk area that is commonly referred to as the 100-year floodplain. This simply means that each year, there is a 1% annual chance that your property will experience flooding. The 100-year flood is also called the base flood.

Flooding is a repetitive but random naturally occurring phenomenon. Although FIRMs show a fixed floodplain boundary, floodplains are dynamic. Watercourses move and change over time. A residence that meets the criteria to be removed from the SFHA today may have an increased flood risk in the future due to such changes.

Flood insurance

The Flood Disaster Protection Act of 1973, and the Act's subsequent amendments, mandate that federally-insured lenders require flood insurance on loans for buildings located within an SFHA. The purchase of required flood insurance is the responsibility of the property owners. If a property owner does not purchase flood insurance, the lender may force the insurance through the property owner's escrow. Such forced insurance is more expensive. Even if not required by law, the District (District) recommends that property owners purchase flood insurance if their structure is located within an SFHA; in a low-lying area next to an SFHA or within a locally-mapped floodplain. (A local floodplain may not be recognized by FEMA but has been identified by a local jurisdiction.) The District also suggests that property owners obtain contents coverage, which can be purchased by renters and owners. The District recommends this because flood events larger than the 1% annual chance flood do occur and can impact property owners outside of an SFHA.

Because of the costs of flood insurance, some property owners wish to have their properties removed from SFHAs. In some instances, this is possible. The information below explains how you might be able to accomplish this.

There are two basic FEMA map revision processes: Letters of Map Change (LOMCs) and Letters of Map Revision (LOMRs).

LOMCs consist of Letters of Map Amendment (LOMAs) and Letters of Map Revision based on Fill (LOMR-Fs). (A LOMR-F is based on the artificial elevation of a structure, usually by constructing the structure on imported fill (dirt). This is done to elevate the building pad to reduce the risk of inundation of the structure during a flood event.) LOMCs are faster to process through FEMA and have little or no processing fees. They also require less assistance from a civil engineer and/or land surveyor.

LOMRs may take many months to process, have larger processing fees and require extensive engineering. While your local floodplain management agency may have to sign-off on your map revision request, only FEMA has the authority to accept or reject requests for map revisions or map amendments.

Be aware that a lender may still require flood insurance even after a home has been removed from the SFHA. If a home has been removed from the SFHA, but the lender still requires flood insurance, the insurance premiums would be reduced due to decreased flood risks.

Locally mapped floodplains

FIRMs only display flood zones that have been evaluated by FEMA. These are areas that tend to be along larger watercourses. Generally, FIRMs do not show floodplains for smaller watercourses or those in very rural areas. However, local floodplain management agencies have additional maps that show many of these other floodplains.

Subdivision plats are another resource that may show areas prone to flooding that are not shown on the FIRMs. Property owners are encouraged to contact their local floodplain management agency to determine if there are flood hazards that are not reflected on the FIRMs. There are many homes in Pima County that are not in an SFHA but are located in locally-mapped floodplains and have been flooded repeatedly.

Map Resources

Pima County Regional Flood Control District's (District) "[Viewing DFIRMS](#)" website should be used to determine the FEMA floodplain status of a property. Since there may be delays between a revision to the FIRM and its availability on the website, you are encouraged to contact your local floodplain management agency to ensure you are using the latest FEMA information and to determine if a property is impacted by any local floodplains not mapped by FEMA. A list of the local floodplain management agencies can be found on page 10 of this document.

II. FEMA FIRM Revision Process

There are several steps to the FIRM Revision Process.

- 1) Determine which Flood Zone the structure is in by going to "[Viewing DFIRMS](#)" or contacting your local floodplain management agency.
(Note: The District does not recommend the use of FIRMettes available from FEMA's website because they do not include map revisions.)
- 2) Determine whether the structure or property qualifies for a map revision.
- 3) Determine the appropriate map revision processes offered by FEMA for your situation and submit the relevant forms and data to FEMA for review and approval.

1) Determining what Flood Zone your structure is in

- The District website uses a free program called MapGuide to display official FEMA digital map data. MapGuide works by layering map data. Therefore, layers on top may mask information on lower layers. When using MapGuide, use the list of layers to the left of the map to control the information shown on the map.
- Although electronic maps are useful, discrepancies between digital data and the officially-adopted paper maps (or Adobe Acrobat (PDF) copies of those paper maps) can occur. The digital data shown on MapGuide is data from FEMA, but it does not represent the officially-adopted (paper version) of the FIRMs. There are times when the superior resolution of MapGuide may make it appear that a structure is outside the SFHA boundary, even though the official FIRM shows the structure inside the SFHA. PDF copies of the official FIRM panels are available through the District's website and the MapGuide application. The PDF will show officially adopted boundaries of the SFHA.
- It is important to check for map revisions when making flood zone determinations. Map revisions are shown on MapGuide. PDF copies of the FEMA- approved map revisions are available through the MapGuide application.
- The SFHA zones signify a high risk of flooding and are defined as follows:
 - Zone A No Base Flood Elevations determined.
 - Zone AE Base Flood Elevations determined.
 - Zone AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

Zone AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

Base Flood Elevation (BFE) means the calculated water surface elevation during the base flood, or 1% annual chance flood. Water surface elevation is the depth of flow during a flood.

2) Determining whether a structure qualifies for a map revision

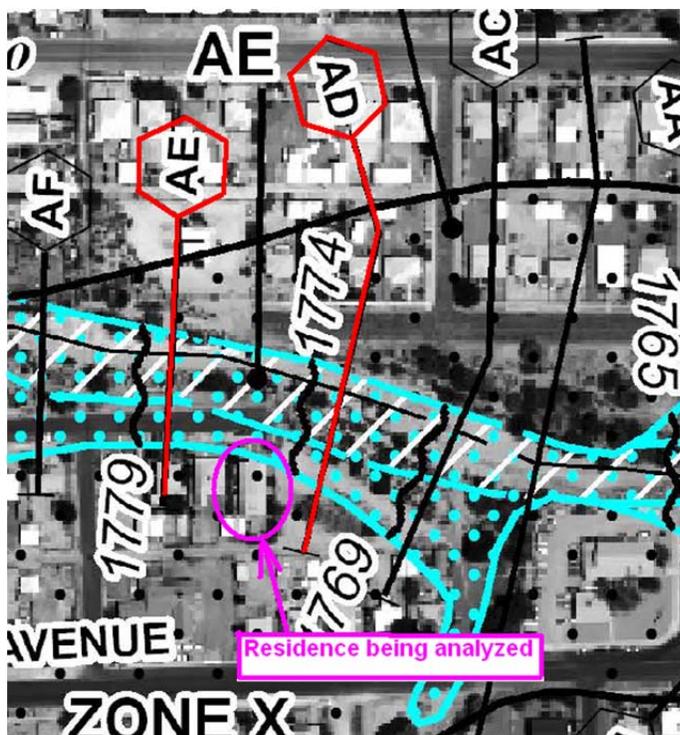
It is possible to obtain a LOMA or a LOMR-F by demonstrating (through a survey or engineering analysis) that the elevations of the lowest floor of the structure and the lowest grade adjacent to the structure are at or above the BFE. Therefore, it is necessary to know the BFE, which is determined at the most upstream point of the structure.

Examples are provided below, but for more information on determining a BFE, refer to the District's [Tech 101](#)ⁱⁱ.

For Zone A floodplains, FEMA has not established a BFE. Contact the local floodplain management agency to see if there is a study that could be used to determine the BFE. The determination of the BFE is required to complete a LOMC application. If the BFE has not been determined by the floodplain management agency, the property owner must have a registered professional civil engineer conduct an analysis of the watercourse to determine the BFE .

For Zone AE floodplains, the BFE should be determined using the lettered cross section data (the flood profile or floodway data table) contained in the Flood Insurance Study (FIS) or subsequent revisions, and interpolating as necessary. For more information on how to determine water surface elevations, refer to the Flood Control District's Technical Procedure, [Tech-101](#)ⁱⁱ.

Figure 1 - Example of a residence in a Zone AE floodplain



In the FIS, the BFE at cross section AD is 1773.0 feet. The BFE at cross section AE is 1778.1 feet. Therefore BFE at the upstream edge of the structure is 1775.55 feet. (Lettered cross sections are delineated in red for this example).

Figure 2 - The BFEs referenced in Figure 1 are from the Floodway Data Table for the Gibson Arroyo found in the FIS

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Gibson Arroyo (continued)								
AA	5,111	70	309	7.8	1,764.7	1,764.7	1,764.7	0.0
AB	5,275	74	258	9.3	1,766.8	1,766.8	1,766.8	0.0
AC	5,386	99	279	8.6	1,768.8	1,768.8	1,768.8	0.0
AD	5,539	117	426	4.9	1,773.0	1,773.0	1,773.0	0.0
AE	5,750	87	340	6.2	1,778.1	1,778.1	1,778.1	0.0
AF	5,908	117	416	5.0	1,782.3	1,782.3	1,782.3	0.0
AG	6,125	58	187	11.2	1,788.4	1,788.4	1,788.4	0.0
AH	6,310	74	259	8.1	1,791.7	1,791.7	1,791.7	0.0
AI	6,500	52	214	9.8	1,794.5	1,794.5	1,794.5	0.0
AJ	6,785	69	212	9.9	1,799.8	1,799.8	1,799.8	0.0
AK	6,859	121	297	7.1	1,803.2	1,803.2	1,803.2	0.0
AL	7,022	117	362	5.8	1,807.3	1,807.3	1,807.3	0.0
AM	7,144	34	207	10.1	1,809.7	1,809.7	1,809.7	0.0
AN	7,228	73	234	9.0	1,811.6	1,811.6	1,811.6	0.0
AO	7,403	52	212	9.9	1,813.6	1,813.6	1,813.6	0.0
AP	7,561	63	202	10.4	1,816.1	1,816.1	1,816.1	0.0
AQ	7,788	103	311	6.8	1,822.4	1,822.4	1,822.4	0.0
AR	8,031	64	225	9.3	1,826.6	1,826.6	1,826.6	0.0
AS	8,173	97	319	6.6	1,829.5	1,829.5	1,829.5	0.0
AT	8,385	102	265	7.9	1,832.3	1,832.3	1,832.3	0.0
AU	8,596	154	444	4.7	1,836.5	1,836.5	1,836.5	0.0
AV	8,781	160	453	4.6	1,842.1	1,842.1	1,842.1	0.0
AW	9,029	58	198	10.6	1,846.8	1,846.8	1,846.8	0.0
AX	9,272	70	234	9.0	1,851.7	1,851.7	1,851.7	0.0

¹Feet above Rasmussen Road

TABLE 8	FEDERAL EMERGENCY MANAGEMENT AGENCY	FLOODWAY DATA
	PIMA COUNTY, AZ AND INCORPORATED AREAS	GIBSON ARROYO

For Zone AE floodplains that do not have cross section information on the FIRM, it is best to determine the BFE from the flood profile found in the FIS rather than making interpolations from the BFE contours on the FIRM. If cross sections exist, but there is no floodway data table, ask your local floodplain management agency for the cross section information.

For Zone AH floodplains, there is no flood profile or floodway data table. The BFE is interpolated from the BFE contours shown on the FIRM panel. In Figure 3, white lines are drawn in the middle of the wavy BFE contours. Then a profile line (red) that intersects the most upstream portion of the structure is drawn perpendicularly to those contours. Next, a red line is drawn perpendicularly to the red line that intersects that portion of the residence furthest upstream.

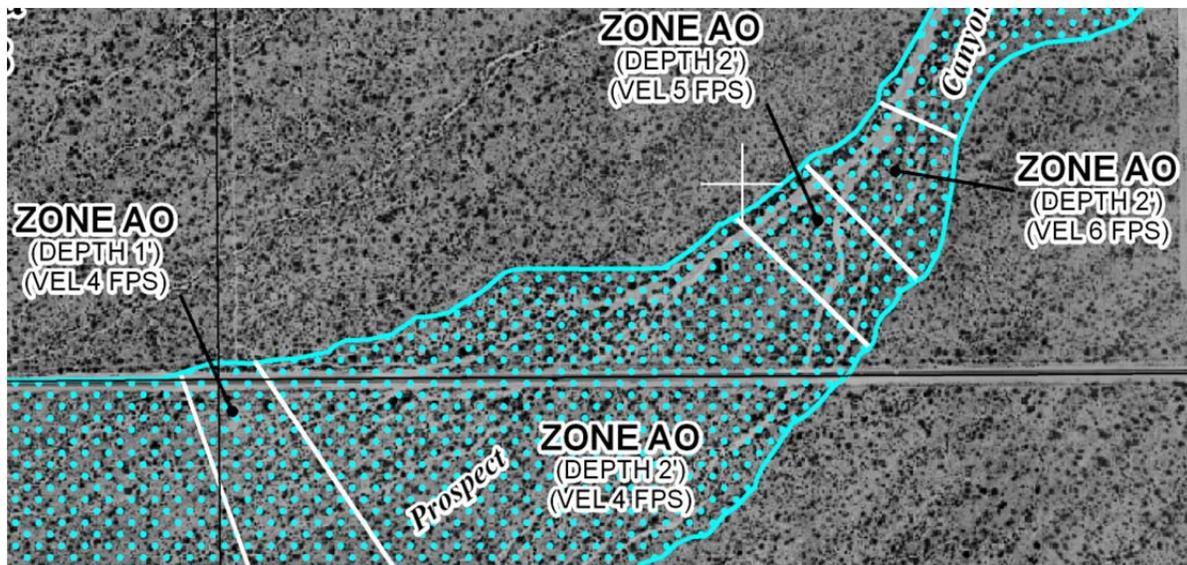
Figure 3 - Profile line drawn in AH flood zone.
BFE determined to be 2525.7 feet, NAVD-88.



For Zone AO floodplains, obtaining a LOMC document to remove a structure or a property from the floodplain can be very difficult. The Zone AO floodplain is an approximated floodplain with average depths of flow of 1, 2, or 3 feet used instead of BFEs.

There are two types of AO designations, sheet flooding and alluvial fan sheet flooding. Alluvial fan AO zones have average flow velocities associated with them (see Figure 4). The base flood depth within Zone AO is measured from highest adjacent natural grade. Since flood depths are measured from natural grade, it is not possible to show that the natural grade is above the flood depth. The only possible method for removing a structure is if it is elevated on fill and the LOMR-F process is used. However, the National Flood Insurance Program (NFIP) regulations generally do not allow for the use of fill as a means to remove a structure from an alluvial fan Zone AO floodplain (44 CFR § 65.13.b) due to the uncertain flow characteristics of this type of floodplain.

Figure 4 - Zone AO Alluvial fan, shown on the FIRM panels, have average velocities (VEL) listed as well as depth of flooding. FPS indicates feet per second during the regulatory flood event.



3) Determining the appropriate Map Revision product

There are several map revision and map amendment options available from FEMA.

LOMA

A LOMA is the simplest method to remove a structure, property or a portion of a property from the SFHA. There is no fee for a LOMA and approvals may occur within 30 days if the applicant properly completes all sections of the application. There are two types of approvals. If a structure is within the SFHA, an acceptable application will result in a FEMA document entitled "LOMA Removed". If a structure is more than 30 feet from the SFHA, a property owner may submit an MT-1 form. For the form to be accepted there must be FEMA confirmation of the required distance from the SFHA. Applications that are approved will result in an "Out-As-Shown" letter. This letter is most often used to settle disputes with lenders who do not recognize that a structure is outside the mapped floodplain.

The District does not recommend property owners submit for a LOMA to remove only a portion of a property from the SFHA. A survey description of an area that has been removed from an SFHA can be difficult to plot out on a FIRM panel. This can create problems with lenders who may incorrectly interpret survey descriptions.

eLOMA

eLOMA is an electronically submitted Letter Of Map Amendment. It requires the same process as a LOMA except everything is submitted electronically by a surveyor or engineer who is registered with FEMA to perform an eLOMA. The processing time for an eLOMA is faster than the regular LOMA process. The eLOMA process can be found at www.hazards.FEMA.gov.

LOMC Online

If a homeowner has all the necessary information to apply for a LOMA, it may be possible to submit that information online through FEMA's online process. For more information, go to www.FEMA.gov and type in "Online LOMC" in the search window.

LOMR-F

A LOMR-F is a Letter of Map Revision Based on Fill. A LOMR-F may be used if a structure or property is elevated on fill and the top of the fill around the entire perimeter of the structure and the lowest floor of the structure are at or above the BFE. The fill must meet the requirements of NFIP regulations as outlined in 44 CFR § 65.5. LOMR-F applications require a form be signed by a community official from the local floodplain management agency to acknowledge the presence of the fill in the floodplain. The local agency may require engineering certification that the fill meets the compaction and other requirements of federal code in addition to the local floodplain management requirements.

In Zone AO floodplains, it is difficult for surveyors to certify a home or area has been elevated above natural grade after construction if no survey benchmarks were created before the area was disturbed by construction. A property owner building a new structure and wishing to use the LOMR-F to remove a future structure from a Zone AO floodplain, should have a surveyor create a pre-disturbance benchmark. This will facilitate the LOMR-F post-construction survey. LOMR-F submittals are made using FEMA's MT-1 forms. Review fees vary depending on how many properties are involved with the application. Significant fill encroachments into floodplains may not qualify for a LOMR-F application. To change the floodplain designation, property owners with large encroachments must apply for a LOMR. Note: In general, the National Flood Insurance Program (NFIP) regulations do not allow for the use of fill as a means to remove an area from an alluvial fan floodplain (44 CFR § 65.13.b).

LOMR A LOMR is a full map revision that creates a new floodplain boundary. Depending on the process, the new floodplain may include base flood elevations, multiple flood profiles, and floodway delineations. A community acknowledgement form signed by a representative from the local community must be submitted with a LOMR. Local communities use this process to review the LOMR for accuracy and completeness, therefore it is important for engineers who work with property owners to coordinate with the local floodplain agency. LOMRs must be submitted by registered civil engineers. To assist engineers in providing spatially projected work map data, the District will can provide FIRM data through ESRI or AutoCAD formats. LOMR submittals are made using FEMA's MT-2 forms. The LOMR process may take several months to complete and review fees depend on the type of LOMR that is being sought.

III. Additional Information to Consider

There are several important considerations to keep in mind.

- "Lowest Adjacent Grade" on the Elevation Certificate means the lowest ground elevation adjacent to the structure. If the lowest adjacent grade is below the BFE, FEMA will deny the LOMC because the floodwaters will touch some portion of the structure.
- "Lowest Floor" on the Elevation Certificate includes the lowest elevation of enclosed crawl spaces, sunken rooms, basements and enclosed attached garage floors. Even if the lowest adjacent grade is above the BFE, if the Lowest Floor is below the BFE, FEMA will not issue a LOMC.
- The use of fill for elevation may require an encroachment analysis. Local floodplain agencies can provide further direction on this issue.

- Floodways are areas in the SFHA that are reserved for the conveyance of floodwaters during major flood events. LOMA and LOMR-F submittals in floodways require community acknowledgment from the local floodplain management agency and applicants may be required to submit additional engineering analyses. FEMA requires that communities verify the encroachment will not increase regulatory water surface elevations. A community may be suspended from the NFIP if it fails to monitor development in the floodway. A suspension means the community may not receive disaster assistance for damages that occur in Special Flood Hazard Areas. In addition, flood insurance through the NFIP will not be available to residents; and home-lending processes for properties in Special Flood Hazard Areas will be affected.
- FEMA sometimes uses the term “Regulatory Flood.” This is the type of flood that creates the high risk areas known as Special Flood Hazard Areas (SFHA) on the FIRMs. These flood hazard zone designations all start with the letter “A”. Because the Regulatory flood has a one percent chance of occurring any given year, it is commonly referred to as the 100-year flood.
- In the state of Arizona the term “Regulatory Flood Elevation” can be confusing. FEMA refers to the regulatory water surface elevation as the elevation of the regulatory event (commonly referred to as the 100-year flood). Arizona Revised Statutes refer to the regulatory flood elevation as the water surface elevation of the base flood plus one foot (A.R.S. § 48-3601.11). Because this document refers specifically to FEMA’s SFHA floodplains, the regulatory elevation is the calculated elevation shown on the FIRMs without the additional one foot that is required by Arizona state statutes that govern the construction of structures.
- An alluvial fan is a geologic formation of alluvium or sediment that has formed downstream of a concentration point such as the mouth of a mountain canyon. Flooding on alluvial fans is characterized by high-velocity flows, active erosion, sediment transport and deposition, and unpredictable flow paths. Alluvial fan flooding is depicted on a FIRM as Zone AO, with average flood depths and velocities. It is more difficult to obtain map revisions on an alluvial fan. FEMA LOMR application and processing fees are also greater on alluvial fan floodplains.

General Information on Flood Insurance

- Your property may be at risk from flooding even if it is not in an SFHA. Between 20 and 25 percent of all flood damage claims occur in areas outside of SFHAs.
- Nationally, there is a 26 percent chance of a home being flooded during the life of a 30 year mortgage.
- In Arizona, more than 35% of flood insurance claims are for properties outside of SFHAs.
- Flood insurance can be purchased for structures that are outside of SFHAs. Such insurance is less expensive due to the lower risk of flooding.
- Flood insurance doesn’t automatically cover contents. Contents coverage must be purchased separately and can be purchased by owners and renters.

- Structures within an SFHA are six times more likely to be flooded than damaged by fire.

Local Floodplain Management Agencies

The City of Tucson

Development Services Department
201 N. Stone Avenue, 1st Floor
Tucson, AZ 85701-1207
Phone (520) 791-5609

The City of South Tucson

Planning and Zoning Department
1601 South Sixth Street
South Tucson, Arizona 85713
Phone (520) 917-1563

The Town of Oro Valley

Department of Public Works
680 N. Calle Concordia
Oro Valley, AZ 85737
Phone (520) 229-5070

The Town of Marana

11555 West Civic Center Drive
Marana AZ, 85653-7090
Phone: (520) 382-2600

The Town Sahuarita

Public Works
375 W. Sahuarita Center Way
Sahuarita, Arizona 85629
Phone (520) 344-7100

Unincorporated Pima County

Pima County Regional Flood Control District
Floodplain Management Division
201 N Stone Ave., 9th Floor
Tucson Arizona, 85701-1207
Phone (520) 724-4600

FEMA LOMA and LOMR forms can be obtained at: <http://www.fema.gov/forms>

ⁱ “Viewing DFIMs” web address is: <http://webcms.pima.gov/cms/one.aspx?portalId=169&pageId=63421>

ⁱⁱ “Technical Procedure 101” web address is:
http://webcms.pima.gov/UserFiles/Servers/Server_6/File/Government/Flood%20Control/Rules%20and%20Procedures/tech101.pdf