



STATE OF NEVADA MEETING MINUTES NEVADA HAZARD MITIGATION WORKING GROUP

Attendance	DATE	March 18, 2025
	TIME	10:00 a.m.
	METHOD	Zoom
	RECORDER	Loren Borst

Appointed Voting Member Attendance

Member Name	Present	Member Name	Present	Member Name	Present
Eric Antle	X	Sarah Fichtner	X	Ceira Sampson	ABS
Andrew Trelease – Vice Chair	X	Shari A. Davis	ABS	Dawn Johnson	X
Stephen Aichroth	X	Rich Koehler	X	Star Albert	X
Solome Barton	X	Donielle Allen	X		

Legal/Administrative Staff

Name	Agency	Present
Bill Elliott – Chair (Non-Voting)	Nevada Division of Emergency Management/ Homeland Security (DEM/HS)	X
Samantha Ladich – Senior Deputy Attorney General (DAG)	Attorney General's Office –	X
Janell Woodward – Non-Voting Member	Nevada Division of Emergency Management / Homeland Security (DEM/HS)	X

1. CALL TO ORDER AND ROLL CALL

Chair Bill Elliott, DEM/HS called the meeting to order at 10:00 a.m. Roll call was performed by Loren Borst, DEM/HS. Quorum was established for the meeting.

2. PUBLIC COMMENT

Chair Bill Elliott opened the first period of public comment for discussion.
There were no public comments.

3. APPROVAL OF MINUTES

Chair Bill Elliott requested a motion to accept the minutes from November 20, 2024. Andrew Trelease, Southern Nevada Regional Flood, moved to accept the minutes. Solome Barton, North Las Vegas Emergency Management seconded.

4. Volcano Study Report Out

Craig dePolo, Nevada Bureau of Mines and Geology, informed the group that although the Nevada volcanic hazard has always been low in the mitigation plans, there are a number of volcanoes in the state. Dr. dePolo discussed the grant that involved reviewing the volcanic hazard of the state, as well as dating some of the younger eruptions in the state, noting that these are the most critical from a hazard point of view.

Dr. dePolo began his presentation with a discussion of the 165 quaternary volcanoes and seven volcanic fields in the state, as well as the different types of eruptions, noting that monogenetic basaltic eruptions dominate over the last million years. Dr. dePolo indicated that the most recent eruption took place approximately five to six thousand years ago, and was a phreatomagmatic eruption near Fallon, the Soda Lake volcano. Dr. dePolo informed the group that the Lahontan Valley volcanic field has a moderately high risk of an eruption, the Lunar Crater volcanic field has a low to moderate risk, and added that four fields are active but low risk, and two fields are inactive.

Dr. dePolo next discussed volcanic terms and definitions, noting that volcano has a few different definitions, including a vent that erupts magma on a surface, as well as a landform such as a cinder cone, and the process of volcanism itself. Dr. dePolo discussed volcanic rocks, noting that ash is less than two millimeters, lapilli is between two and 64 millimeters, and anything larger is called a bomb if fluid or a block if solid. Dr. dePolo informed the group that the common land form in Nevada are volcanic cones, which are named after the material of which they are made, then discussed lava flows and the two general types: aa flow, and pahoehoe flow. Dr. dePolo explained that eruption types are as follows: Hawaiian eruptions, Strombolian eruptions, Vesuvian eruptions, magmatic eruptions, and cinder cone (phonetic) eruptions. Dr. dePolo indicated that nearly all Nevada volcanoes are monogenetic, meaning they erupt in a single eruptive cycle, which makes it difficult to judge activity from an individual volcano point of view.

Dr. dePolo informed the group that there are seven quaternary volcanic fields in Nevada: Buffalo Valley; Lahontan Valley; Western Nevada; Aurora near Mono Lake; the Lunar Crater field in the middle/upper part of Nye County; the Clayton-Columbus; and Southwest Nevada down by Yucca Mountain. Dr. dePolo described the term "index," noting that it is the average inner eruption time that give an idea on how active a field is while it is erupting, and involves taking the duration of volcanic activity and time and dividing it by the number of eruptions minus one.

Dr. dePolo discussed the northernmost volcanic field, the Buffalo Valley volcanic field, in western Pershing County. Dr. dePolo noted that there are 18 volcanoes in eight groups over a distance of about 12.5 kilometers and indicated that this field was active between 2 million and 1.1 million years ago. Dr. dePolo indicated that this field had four episodes, based on the dating, and the eighth there is 113,000 years, which points to the following: this is a very old field; it has not had an eruption in 1.1 million years and as such, can be considered inactive; and based on the episodes, the pattern of eruptions began on the lower left approximately 2 million years ago, followed by the northern part 300,000 years later, then the middle, and then back to the northern end. Dr. dePolo further noted that the magma was formed 40 to 60 kilometers down by partially melting some mantle that made it all the way up through the entire lithosphere and erupted.

Dr. dePolo next discussed Western Nevada volcanic field, noting that there are 13 isolated volcanoes that were active between 2.55 and 1.2 million years ago. Dr. dePolo indicated that there were two basic episodes of activity, the first being an eruption out of Steamboat approximately 2.5 million years ago, and then all of the other volcanoes erupting approximately 1.5 to 1.2 million years ago, creating an eight of 38,000 years. Dr. dePolo informed the group that because this field has not had an eruption in 1.2 million years, it is considered inactive.

Dr. dePolo next discussed the Aurora volcanic field, noting that there are 10 to 15 volcanoes that were active all through the quaternary, which began 2.6 million years ago. Dr. dePolo noted that this field began erupting from time to time all the way up to approximately 40,000 to 110,000 years ago, and consisted of three basic episodes. Dr. dePolo noted that although there are a number of volcanoes, they have been spread out throughout the field's entire history, giving this field an eight of 320,000. Dr. dePolo further noted that because it has been 40,000 to 110,000 for the youngest volcano, this field is considered active.

Dr. dePolo next discussed the Lunar Crater volcanic field, noting that there are over 103 volcanoes in this field that were active from 1.1 million years to 35,000 years ago. Dr. dePolo noted that this is a very active field, with an eight of 13,000 years, the lowest Nevada has. Dr. dePolo indicated that the youngest eruption is the Marcath volcano from 24,00 years ago. Dr. dePolo explained that partial melting is occurring in the asthenospheric mantle, with the lithosphere, which is the upper crust part of the Earth, above that. Dr. dePolo noted that 60 kilometers is a very thin lithosphere, which is one of the reasons the heat can get up really close to the surface. Dr. dePolo pointed the group to the fault map, which shows the two biggest range bounding faults that are on either side of the Lunar Crater volcanic field dip in towards the field in a rift kind of fashion. Dr. dePolo further noted that the most active parts of these faults are opposite where the Lunar Crater volcanic field is.

Dr. dePolo next discussed Southwest volcanic field near Yucca Mountain, which consists of eight volcanoes. Dr. dePolo explained that the five volcanoes in a row erupted approximately 1,000,000 years ago, and the two volcanoes north of Beatty erupted approximately 320,000 years ago. Dr. dePolo indicated that the most recent event is 77,000 years ago at the Lathrop Wells cone. Dr. dePolo explained that there is a 170,000 year eight on this, and that this is considered an active field.

Dr. dePolo next discussed the Clayton Columbus volcanic field, which had four isolated events, three of which were between 1 and 2 million years old, and then the volcano in the middle with an eruption approximately 390,000 years ago. Dr. dePolo indicated the eight is more than half a million years, but is still considered potentially active, although very low hazard.

Dr. dePolo indicated that the Lahontan Valley volcanic field is the one that Nevada needs to worry about. Dr. dePolo explained that there are three main volcanoes, and they have been erupting all through quaternary: Rattlesnake Hill; Upsal Hogback; and Soda Lake. Dr. dePolo explained that the youngest event is about 5,000 years old, and that there are two basic episodes of activity in

this field. Dr. dePolo discussed the Rattlesnake Hill volcano first, noting that it goes from 2.5 million years down to the recent cone by Fallon at 900,000 years. Dr. dePolo explained that the underground basaltic volcanic field is a major aquifer for Fallon and the naval air force base, and added that it is buried under as much as 180 meters of sediment from lake Lahontan. Dr. dePolo noted that this is considered extinct because it has been over 900,000 years since last activity. Dr. dePolo next discussed the Upsal Hogback volcano, which erupted between 20 and 14,000 years ago through Lake Lahontan. Dr. dePolo noted that there is a possibility that there were also two earlier eruptions out of this volcano or near it. Dr. dePolo discussed a mineral called palagonite that occurs above the water line, and provides indication that the volcano erupted through 45 meters of water and was then submerged by the lake post-eruption. Dr. dePolo indicated that a lot of this volcano, because it was submerged later by the lake, has eroded away. Dr. dePolo also indicated that this, to date, has been the youngest eruption. Dr. dePolo discussed the Wono ash that has been dated at 27,000, as well as a possible older eruption of another basaltic sand below. Dr. dePolo discussed that these are not positive features on earth, but rather are excavated into the surface of the earth, and indicated that the youngest eruption at Soda Lake has been dated by Rodrigues and Ruprecht at 5 to 6,000 years based on the lack of shorelines. Dr. dePolo informed the group that it turns out the lake beds about 600 feet north of Soda Lake there are the Younger Dryas lake, and pointed out the volcanic ash from the most recent eruption, below which is 5.8 meters of soft clay, and then 20 centimeters thick worth of coarse cinders. Dr. dePolo reiterated the events from most recent to oldest: Soda Lake, 6 to 5,000 years ago, followed by a second event 13,600 years ago; Upsal Hogback from 20,000 to 15,500 years ago; another Lahontan Valley explosion, possibly from Upsal Hogback, between 30,000 and 27,000 years ago; an eruption that formed right before the most recent lakes come into Lahontan Valley between 45 and 35,000 years ago. Dr. dePolo noted that when looking at the lower times between eruptions, this is the highest hazard volcanic field in the state, and it is not unreasonable to think that another eruption could occur, and potentially sooner than later. Dr. dePolo explained that there would likely be lots of preliminary activity prior to an eruption, such as earthquakes and uplift of the ground, and added that at Upsal, there is a permanent GPS station that would alert the state right away. Dr. dePolo discussed the consequences of such an eruption, noting that there is a population of just under 10,000 that might need temporary relocation, including the Paiute Shoshone Indian Colony, as well as two airports. Dr. dePolo indicated that in case of an eruption, all planes would need to get out, two highways, a railroad line, military facilities, and the Coast Guard Cutter would all need to be cleared out.

Dr. dePolo provided the group with a plotted chart of the dates of eruptions over the last 2 million years, noting that there were 55 dates. Dr. dePolo explained that about a third of the quaternary volcanoes have been dated, and added that there is a change that occurs in Nevada in volcanism at the 1.1 million year mark, which included both inactive fields turning off, and Lunar Crater coming on. Dr. dePolo reiterated the risk among the fields: Lahontan Valley volcanic field has a moderately high risk of eruption; Lunar Crater volcanic field has a low to moderate risk that could cut off the main east-west route through the center of the state were it to happen; Southwest volcanic field is low risk; Aurora volcanic field is low risk; and Clayton Valley is low risk.

Dr. dePolo next discussed out of state volcanoes, noting that there are 1,776 volcanoes around Nevada, but the only ones that are potentially worrisome are Eastern California because they are a lot more active and have a potential for ash across Nevada carried in on westerly winds. Dr. dePolo discussed the Lassen Peak eruption of May 22, 1915, noting that this was a Vesuvian eruption that dwarfed the Sierras by a seven-mile-high ash cloud approximately 20 to 30 minutes into the eruption. Dr. dePolo discussed the ash measured in Inlay that went as far as Elko. Dr. dePolo explained that the volcano itself was 140 kilometers west of the state line.

Dr. dePolo provided recommendations to the state, noting that five of the seven quaternary volcanic fields can be considered active or potentially active. Dr. dePolo reiterated that the Lahontan Valley volcanic field has a moderate to high risk event of an eruption, and Lunar Crater has a low to moderate risk. Dr. dePolo noted that because these are spatially restrictive, the whole state does not have to be considered, but areas that could be affected do need to be considered. Dr. dePolo added that the most likely type of eruption will be a basaltic phreatomagmatic eruption and/or a basaltic fissure cinder cone lava flow Hawaiian or Strombolian eruption and the other potential impact is an eastern Californian eruption. As such, Dr. dePolo recommended that the state hold two tabletop exercises, one for an eruption in Lahontan Valley volcanic field and one for an eruption in the Lunar Crater volcanic field, that includes local state subject matter experts and the USGS who can work through the potential consequences, the emergency responses, and the emergency mitigation that can occur. Dr. dePolo also recommended an out-of-state eruption tabletop exercise, as well as documentation of results that can be put into a report.

Dr. dePolo provided thanks to many of those who helped him with this project, including: the Nevada Bureau of Mines and Geology; the Nevada Division of Emergency Management; FEMA; the Nevada Ingenious Project; Dr. Chris Henry; Rachel Micander; Dr. Jim Faulds; Dr. Kathrine Rodrigues of DRI; Janell Woodward; Donna dePolo; Tom Sawyer; and Dr. Ruprecht of UNR. Dr. dePolo indicated that the counties will need to do their own mitigation sections, but indicated that he has provided a table in the documentation that shows the areas on which counties should specifically focus.

Andrew Trelease noted his happiness that Las Vegas was in imminent danger of volcanic activity, and thanked Dr. dePolo for the presentation.

Jon Bakkedahl asked about the threats and risk and potential mitigations for Carson City.

Craig dePolo indicated that the nearest volcanic field to Carson City is inactive, so likely the nearest issues for Carson would be ash fall out from California. Dr. dePolo indicated that the most likely eruptions would be from the Mono Lake areas or the Lassen volcanic field if it was a northern, but reiterated that mostly be an ash eruption. Dr. dePolo indicated that a lot of people leave town because of the corrosive effects on vehicles, and more vulnerable things like sewer systems can be impacted by a lot of ash, along with infrastructure.

5. Review of Submitted Building Resilient Infrastructure and Communities (BRIS) Applications

Janell Woodward, DEM/HS, State Hazard Mitigation Officer, indicated that this agenda item would tie in with item 6, which she would be addressing next.

6. Future Mitigation Funding

Janell Woodward, DEM/HS, State Hazard Mitigation Officer, explained that FEMA, with the new administration, has pulled back the NOFOs for numerous mitigation grants, among others, so as to make changes that align with the new administration's priorities. Ms. Woodward indicated that as soon as DEM has any information, they will let everyone know. Nonetheless, Ms. Woodward recommended that anyone with projects to go into BRIC or flood mitigation assistance program begin their applications. Ms. Woodward added that there is an expectation of a time extension instead of April 18, and noted that the further along everyone is in their applications, the better. Ms. Woodward further noted her expectation that none of the major information would change in the NOFOs, but potentially things like climate change requirements would be removed.

Janell Woodward next discussed the Hazard Mitigation Grant Program Post-Fire, noting that DEM has about 6.5 million dollars for spend down. Ms. Woodward added that those applications are due to FEMA by the end of May, and will likely be brought forward to leadership about a month before for review. Ms. Woodward indicated that when there is disaster funding at the same time as pre-disaster funding, the post-disaster funding tends to be spent more easily than the pre-disaster funding as the post-disaster spending is easier. Ms. Woodward concluded by noting that DEM is looking at about \$2 million in set aside, and is not expecting that to change, but cannot guarantee if some of the different requirements on the set asides will change.

7. Public Comment

Chair Bill Elliott opened the second period of public comment. There was no public comment.

8. Adjournment

Chair Bill Elliott asked for a motion to adjourn. Andrew Trelease, Southern Nevada Regional Flood, made a motion, Rich Koehler, Nevada Bureau of Mines and Geology, seconded. The motion carried unanimously. The meeting was adjourned at 11:07 a.m.