

Volcanic ash is:



<2mm (0.1 in) diameter, hard, abrasive and corrosive, and conductive if wet

VOLCANIC ASHFALL

ADVICE FOR: URBAN CLEAN-UP OPERATIONS

ASH CLEAN-UP IN URBAN AREAS

- Prompt clean-up of urban areas is essential to minimize damage and disruption.
- Ashfall accumulations of only a few mm (approx 1/4 in) thick will generate large volumes of ash for collection and disposal.
- Experience has shown that efficient and effective clean-up operations need to be planned and coordinated in advance of ashfall events.

IMPORTANCE OF ASH CHARACTERISTICS

- In general, ash is highly abrasive and can cause accelerated wear and tear on equipment.
- Fine ash (<0.5 mm/<0.02 in particle size) readily remobilizes into the air, so that conventional street cleaning equipment may not pick it up.
- Coarse ash (>1 mm/<0.04 in particle size) is less readily remobilized, but may be crushed into smaller particles (e.g. by pedestrians, vehicles or during ash removal).
- Some ash deposits may 'cement' over time, especially if wetted and then dried.

ASHFALL DEPTH	TYPICAL IMPACTS IF NOT CLEANED UP	SCALE OF CLEAN-UP
<0.5 mm (<0.04 in)	Minimal.	Usually no action required.
0.5-2 mm (0.04-0.08 in)	Minor traffic disruption due to coverings of road markings, loss of traction and reduced visibility.	Minor clean-up. Sweeping and wetting of roads, paved areas, and roofs/gutters usually sufficient.
2-30 mm (0.09-1.18 in)	Substantial traffic disruption. Many building gutters will collapse or be blocked. Ash may enter and block drainage networks. Risk of severe damage to wastewater treatment plants with mechanically-cleaned screens.	Moderate clean-up. All roads, roofs, and paved areas require cleaning. Private properties may require assistance with clean-up and ash removal. Need for coordinated clean-up. Ash disposal sites established.
>30 mm (>1.18 in)	Severe traffic disruption. Most gutters will collapse. High risk of ash entering and blocking drainage networks. High risk of severe damage to wastewater treatment plants with mechanically-cleaned screens.	Major clean-up. As above, but with considerably larger volumes which will require greater resources and/or cleaning time. Parks and gardens may also require clean-up.

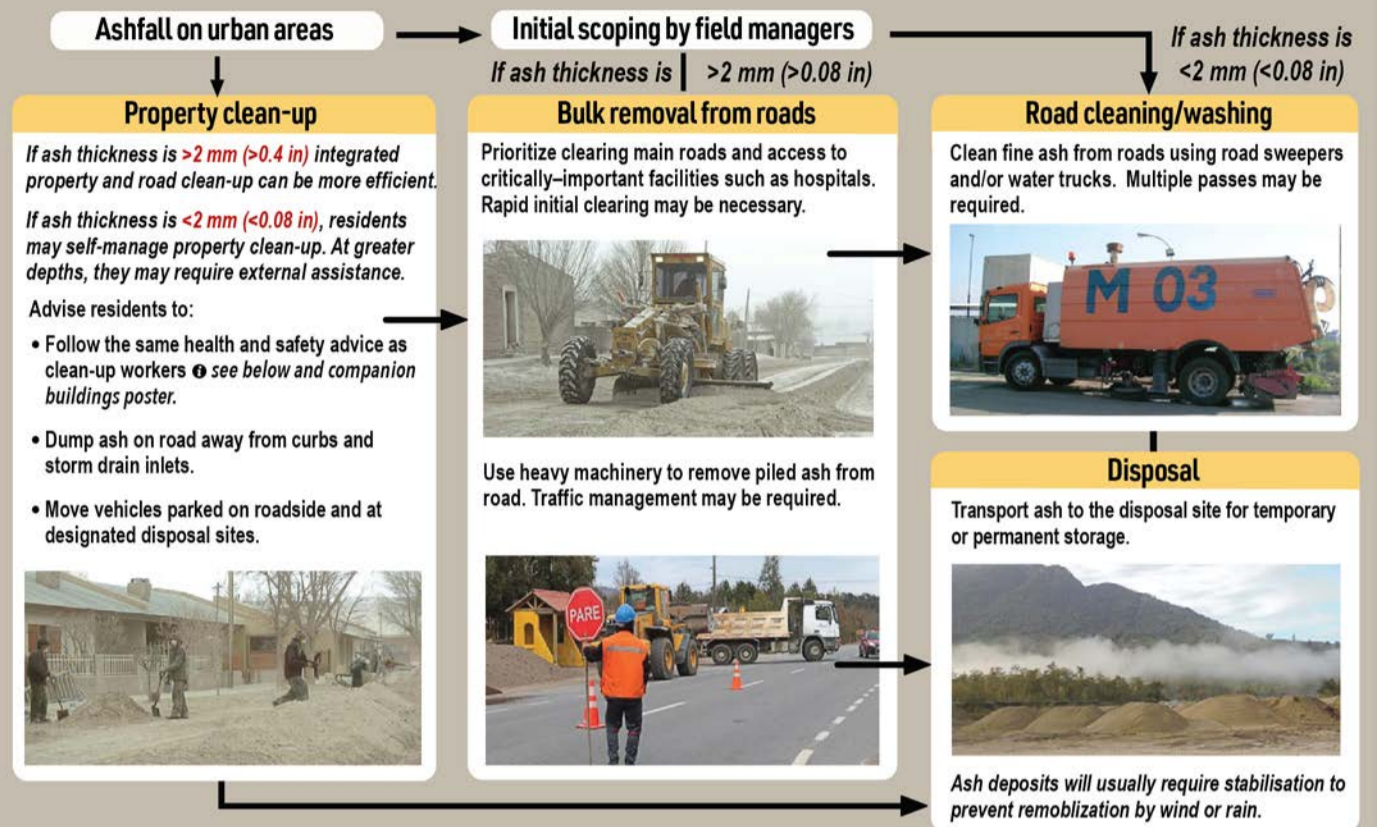
FURTHER RESOURCES

https://volcanoes.usgs.gov/volcanic_ash/transmission_distribution.html

www.ivhhn.org (volcanic health hazards information)

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ASH CLEAN-UP GUIDE



RECOMMENDED ACTIONS

WHERE TO FIND HAZARD & WARNING INFORMATION

Refer to the website of your local volcano observatory, national weather service and/or disaster management agency for warnings of ashfall.

HOW TO PREPARE

Urban areas exposed to volcanic ashfall should develop plans for clean-up and disposal of ashfall, including the following:

- Estimate expected ash volumes and identify potential disposal sites in the region. Disposal may require the isolation of material from aquifers and a low permeability layer.
- Arrange personnel and equipment requirements, including contact lists and mutual support agreements for ash clean-up as part of regional contingency planning.
- Establish strategies for stabilization of deposits such as covering with a layer of soil, snow or gravel and/or seeding to encourage vegetation cover.
- Establish strategies for managing spontaneous volunteerism, including assigning a liaison officer, scheduling regular briefings and providing health and safety support.
- Coordinate plans with emergency management groups, scientists and infrastructure providers.

HOW TO RESPOND

If possible, delay clean-up until ash has stopped falling. However, repeated cleaning or multiple clean-ups may be necessary due to ash remobilization and to prevent ash from cementation.

Health and safety:

- Clean-up managers may have legal duties under local health and safety regulations. Clean-up crews should ensure the following:
 - » Working on roofs or at height is highly hazardous. Roof clean-up must be carefully planned and safe working methods must be used. (See companion Facility Managers-Buildings poster).

- » Ensuring that workers have adequate personal protective equipment (long-sleeved clothing, heavy footwear, fitted goggles and a properly-fitted P2, N95 or FFP2 dust mask).
- » If industry-certified masks are not available, other masks may provide partial protection. For more information: www.ivhhn.org/index.php/ash-protection

Coordination and Clean up Methods:

- Prioritize cleaning priority transport routes and access to key facilities such as hospitals.
- Stop ash from entering drainage systems (e.g. by putting sandbags around inlets).
- Prevent ash entering critical facilities. (See companion Facility Managers-Buildings poster for suggestions).
- Dampen ash on roads to assist clean-up and prevent it lifting into the air. Adding damp sawdust as a binder (using a road spreader) may be effective when clearing fine ash from roads.
- Use water sparingly and non-potable water where possible to avoid depletion of drinking water.
- Coordinate clean-up of private properties and roads in each neighbourhood to optimize resources and reduce recontamination of cleaned areas.
- Note that machinery (e.g. graders, diggers, sweepers and suction trucks) is likely to need additional maintenance in ashy conditions

Communication:

- Clear and ongoing communication with the public before, during and after clean-up operations aids efficiency, public trust and goodwill.
- Advise residents about appropriate methods of clean-up, safety equipment and protective clothing and where they should place ash for collection.