

Advice for URBAN CLEANUP

Prompt Ash cleanup in urban areas is essential to minimize damage and disruption

Characteristics and Effects of Ash

- > Some ashes may 'cement' over time, especially if saturated and then dried.
- > Fine grained ash (<0.5 mm particle size) is readily remobilised by wind and machinery, so it may require a binding agent (removal suggestions available).
- > Coarse ash (>1 mm) is less easily-remobilised, but may be crushed when driven on or moved.
- > Some ash is extremely abrasive and can cause greatly accelerated wear on equipment.

Ashfalls of only a few millimeters depth will generate large volumes of ash for collection and disposal

Ashfall Depth	Typical Impacts of not Cleaned Up	Scale of CleanUp
<0.5 mm	Minimal	Usually no action required
0.5-2 mm	Minor traffic hazards due to covering of road markings and loss of traction.	Minor clean-up • Sweeping of roads, paved areas, and roofs/ gutters usually sufficient.
2-30mm	Significant traffic hazards • Gutter collapse/blockage • Ash may block storm drains • Risk of severe damage to wastewater treatment plants (WWTPs) if ash enters sewer lines	Moderate clean-up • All roads and paved areas on public and private properties require cleaning; • Private properties require assistance with clean-up • Need for coordination of clean-up • Ash dump(s) established.
>30 mm	Severe traffic hazards • Blockage of storm drains and/or sewers, leading to surface flooding • High risk of severe damage	Major clean-up • As above, but with significantly larger volumes which will require greater resources and/or cleaning time; • Vegetated areas (e.g. parks and gardens)

IMPORTANT

- > Removing, transporting, and disposing of volcanic ash is a dirty, time-consuming, and costly challenge.
- > Coordinated action by the public and by organizations can significantly lower costs and speed up the time it takes to remove most of the ash.
- > The fall of a few millimeters of ash on an urban community will likely result in the need for collection and disposal of large quantities of material.

WHERE TO FIND WARNING INFORMATION (ASH CLOUD FORECAST)

The Volcano Ash Advisory Centre (VAAC) or the USGS Volcano Observatories will issue volcanic advisories and graphics forecasts on ash in the atmosphere affecting aviation.

Current Volcanic Ash Advisories – Washington VAAC <http://www.ssd.noaa.gov/VAAC/messages.html>

Current Volcanic Ash Advisories – Alaska VAAC <http://vaac.arh.noaa.gov>

Current Alerts for U.S. Volcanoes - USGS <https://volcanoes.usgs.gov/vhp/updates.html>



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Advice for **URBAN CLEANUP**

Proper disposal sites are needed quickly

This is critical to ensure that:

- > Ash does not have to be moved a second or third time; and
- > Cleanup operations can begin immediately.

TO AID WITH THIS READINESS, APPROPRIATE PREPLANNING OF DISPOSAL SITES SHOULD BE CONSIDERED

The time and effort required to remove and dispose of ash depends on the depth and aerial extent of the deposits, especially in urban and populated areas, and the availability of machinery (for example, from areas outside the zone of ashfall) to clean it up. Cleanup operations can take weeks to months to complete.

FACTORS THAT IMPACT THE TIME REQUIRED FOR CLEANUP

- > Additional ashfall before the cleanup operations are completed.
- > Wind, which stirs and billows the ash into the air, can spread ash particles over areas already cleaned, subjecting the public and cleanup personnel to even more airborne ash and exposing machinery and equipment to increase wear or damage.
- > Rain, which may help wash ash from roofs, but also lead to damaged gutters, short circuiting of power distribution systems, deposition of ash in low areas, and clogged storm-water drains and wastewater systems. Ash deposits may harden after being wet, making cleanup more difficult.

PERSONNEL PROTECTION PPE

Workers and volunteers involved in clean-up operations are typically exposed to high concentrations of airborne ash particles, and they should be supplied with appropriate personal protection equipment to reduce the potential for adverse health effects. Such equipment can include eye protection, filter masks, respirators, overalls, hats or helmets, gloves, and extra lighting. It might also be necessary to take extra care of people helping to clean-up the ash, including the supply of food, water, toilets, and temporary lodging for workers, many of whom may work in 12-hour shifts.



Protective facemask is necessary to prevent inhalation of ash during cleanup

ADDITIONAL INFORMATION

- > https://volcanoes.usgs.gov/volcanic_ash/cleanup_disposal.html
- > <http://www.ivhhn.org>
- > Primary source: https://volcanoes.usgs.gov/volcanic_ash/Sewer_networks_stormwater_drains.html