

# ADVICE FOR URBAN CLEAN-UP OPERATIONS

VOLCANIC ASH IS: HARD, HIGHLY ABRASIVE, MILDLY CORROSIVE AND CONDUCTIVE WHEN WET.

## ASH CLEAN-UP FROM URBAN AREAS & CLEAN-UP METHODS

- Prompt clean-up of urban areas is essential to minimise damage and disruption
- Ashfalls of only a few mm depth will generate large volumes of ash for collection and disposal

### EFFECT OF ASH CHARACTERISTICS

- Some ashes may 'cement' over time, especially if saturated and then dried
- Fine grained ash (<0.5 mm particle size) readily remobilises, so may require a binding agent
  - » For more information: <http://volcanoes.usgs.gov/ash/remove.html>
- Coarse ash (>1 mm) is less easily-remobilised, but may be crushed when driven on or moved
- Some ashes are extremely abrasive and can cause greatly accelerated wear on equipment. Refer to 'Advice for Rooding Managers' poster

ASHFALL DEPTH	TYPICAL IMPACTS IF NOT CLEANED UP	SCALE OF CLEAN-UP
<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 to WWTPs if ash enters sewers	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) may require cleaning too;

## ASH CLEAN-UP GUIDE



## RECOMMENDED ACTIONS

### WHERE TO FIND WARNING INFORMATION

See [www.geonet.org.nz](http://www.geonet.org.nz) for ashfall forecasts in the event of an explosive eruption.

### HOW TO PREPARE

- Further guidance on ash clean up and disposal is available from:
  - » [http://www.aelg.org.nz/volcanic-impacts/visg\\_home.cfm](http://www.aelg.org.nz/volcanic-impacts/visg_home.cfm)
  - » <http://volcanoes.usgs.gov/ash/remove.html>

Areas exposed to ash hazards should have plans in place beforehand covering the following aspects:

- **Personnel and equipment requirements.** Include mutual support agreements for ash clean-up as part of regional contingency planning
- **An incident management system/database** to manage the clean-up operation
- **Identification of potential disposal sites** on a regional basis as part of contingency-planning
- **Strategies for stabilisation of deposits**

**Spontaneous volunteerism:** Volunteer labour can significantly speed clean-up operations, but requires effective management and integration with professional crews

- The following may help: regular briefings, liaison officers, provision of appropriate equipment and health and safety support

### MORE INFORMATION

THE FOLLOWING RESOURCES PROVIDE FURTHER INFORMATION ON VOLCANIC HAZARDS:

- <http://www.geonet.org.nz>
- <http://www.gns.cri.nz>
- <http://volcanoes.usgs.gov/ash/index.html>
- <http://www.ivhnn.org>

### HOW TO RESPOND

Avoid cleanup until ash has stopped falling where possible.

- Clear and ongoing communication with the public during clean-up operations aids efficiency, public trust and goodwill

### Coordination

- Prioritize clean-up (i.e. arterial routes, key facilities, etc.)
- Avoiding or limiting ash ingress into storm-water networks is a key consideration
  - » Wet clean up methods should only be used where storm-water drains have been isolated.
- A coordinated clean-up of neighbourhoods will optimise use resources and reduce recontamination of cleaned sections

**Machinery may need additional maintenance in the ashy conditions.** See companion poster "Advice for Rooding Managers" for recommended advice ([http://www.aelg.org.nz/volcanic-impacts/visg\\_home.cfm](http://www.aelg.org.nz/volcanic-impacts/visg_home.cfm))

### Health and Safety

- Workers and volunteers involved in clean-up operations can be exposed to high concentrations of airborne ash particles
  - » See [www.ivhnn.org](http://www.ivhnn.org) for more information on Personal Protective Equipment guidance
- Advise extreme caution as many injuries and some fatalities have occurred during ash clean-up operations, particularly due to falls from roofs or ladders.

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