

2021 BC Floods Response

DISPLACED SOIL/GRAVEL AND FLOOD MITIGATION MATERIALS MANAGEMENT

This document has been created in response to the atmospheric river event in British Columbia that started on November 15, 2021.

Recent flood events have generated large quantities of displaced soil and gravel that may be contaminated with substances regulated under the Contaminated Sites Regulation (e.g. asbestos, hydrocarbons, lead, salt, pesticides, etc.). Other contaminants from sewage release and agricultural waste may also be present and represent a public health concern. Removal of soils from affected areas is a necessary part of recovery efforts, but due to its potential to impact receiving locations, appropriate handling practices are necessary to mitigate the further spread of contamination.

Later in the recovery process there will be a need for handling procedures for sandbag, gabion and temporary riprap disposal. Parts of these materials may be managed in a manner consistent with soil, while other parts such as cloth and plastic bags and metal components require recycling or disposal as waste.

This document has been created to provide guidance for the management of soil related materials to assist with the appropriate handling, reuse and disposal efforts.

Key Points to consider:

- There is the potential for soil, gravel and flood mitigation materials (e.g. sandbags, gabion, riprap) to be contaminated both from manmade or natural sources;
- The definition of soil includes unconsolidated mineral or organic material, rock, fill, and sediment deposited on land;
- Soil management has an associated water management component due to the saturated materials that are handled;
- Where possible beneficial reuse options should be considered based on the quality of soil;
- If material has not been characterized it should be managed as suspect waste;
- Soil and water quality can be determined utilizing the expertise of environmental professionals and ministry guidance on sampling and characterization; and
- Further consultation with Ministry of Environment and Climate Change Strategy may be required to determine legal requirements for permanent disposal options under the *Environmental Management Act* and associated regulations.

Guidance for soil management:

- When handling soil, site safety procedures should be followed and appropriate personal protective equipment should be used at all times that can include, but not be limited to:
 - Respiratory protection such as masks
 - Gloves
 - Boots with steel toes and plates
 - Coveralls over clothing
- Please refer to WorkSafe BC requirements for workers handling potentially contaminated materials.

- Caution should be taken when odours are detected, as they may indicate the presence of toxic volatile substances. Care should also be taken with soil near compromised containment barriers and damaged equipment that may release toxic substances.
- To the extent possible, debris and materials not considered soil should be segregated and managed separately prior to soil handling;
- Soil that is removed during recovery should be contained and kept from further infiltration of rain and snow;
- Temporary storage locations should have appropriate liners, walls and covers that do not allow solid and liquid discharges to the environment;
- Water collection from soil containment structures is required with procedures to characterize and appropriately dispose of liquids to ground, stormwater or sewer systems depending on the substance concentrations determined;
- Soil should be characterized following ministry supported guidance. Please refer to [Technical Guidance Document #1](#) for soil characterization of stockpiles;
- Characterized soil should be segregated into quality types (e.g. uncontaminated, commercial land use, industrial land use, waste) and appropriate permanent disposal locations determined by this characterization; and
- Retain consulting services of a qualified professional for appropriate soil characterization, handling and final disposal.

Additional guidance for sandbag, gabion and temporary riprap management:

- The source and pre-flood contamination content of sandbag/gabion fill and rip rap should be determined;
- Sand from sandbags exposed to floodwater should not be used in areas with direct human contact;
- Fill that was uncontaminated before being used in sandbags and gabions and which has not been subsequently contaminated during the flood, may be considered for other uses, as per direction from local authorities and in accordance with applicable regulations;
- Damaged gabion baskets, as determined by a technical specialist, must be returned to the Province for assessment and subsequent disposal; and
- Un-contaminated cloth and polypropylene bags should be recycled and/or disposed as per local instructions.