MAP CODE
BFZN

BUFFER ZONE

USE

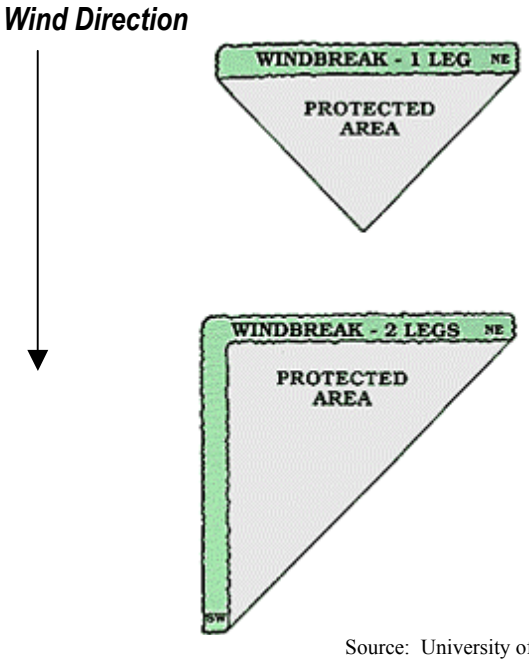
Dust
Erosion/Sediment
Noise
Stormwater
Site Environmental
Visual

What

- A naturally vegetated or replanted area around the perimeter of the aggregate site, or adjacent to an environmentally sensitive area such as a stream, wetland or urban development.

Purpose

- To minimize erosion, improve water quality, intercept dust, reduce noise, act as a wildlife corridor or enhance the visual appearance of the operation with trees, shrubs and plants.
- To reduce pollution into streams and reduce the flow and velocity of stormwater.
- To reduce and redirect wind. A buffer zone can reduce wind speeds on both the leeward and windward sides of an operation, which can reduce dust and noise being carried off-site.



Source: University of Nebraska-Lincoln

Where

- Around the site perimeter, along roadways or ridges, at the edge of any disturbed areas or adjacent to perennial streams or permanent water bodies.
- Alongside stormwater ditches to help reduce the amount of sediment and pollution in the water.
- Perimeter windbreaks of trees and shrubs can protect areas subject to erosion and dust generation due to wind, intercept noise and dust, and provide a visual barrier.

Materials Equipment & Costs

- Native trees, shrubs, seeds and fertilizer.

🛠 Backhoe for trees, shovels, labour.
$ Low to medium.

Plans & Spec's

- A *Mines Act* permit may specify buffer widths.
- A windbreak density of 40% to 60% provides the greatest downwind area of protection, as well as excellent soil erosion control.
- If density is below 20%, the windbreak does not provide useful wind reduction. If density is above 80%, excessive leeward turbulence may reduce the windbreak effectiveness.
- Work around streams is regulated by statutes, regulations and guidelines administered by agencies such as Ministry of Water, Land and Air Protection and Fisheries and Oceans Canada (see Chapter 3).
- Where a natural buffer zone is not available, or the recommended zone width is not attainable, alternatives such as flow barriers, diversions, sediment traps, vegetative planting and silt fences may be used. Use of these alternatives may require government approval.
- Runoff from the disturbed areas should be allowed to spread out over the entire length of the buffer zone, and not channelled into a single discharge point within a buffer zone.

Relative effectiveness of different vegetation types for providing specific buffer zone benefits

Benefit	Vegetation Type		
	Grass	Shrub	Tree
Stabilize bank erosion	Low	High	High
Filter sediment	High	Low	Low
Filter nutrients, pesticides, microbes			
• Sediment bound	High	Low	Low
• Soluble	Medium	Low	Medium
Aquatic habitat	Low	Medium	High
Wildlife habitat			
• Range/pasture/prairie wildlife	High	Medium	Low
• Forest wildlife	Low	Medium	High
Economic products	Medium	Low	Medium
Visual diversity	Low	Medium	High
Flood protection	Low	Medium	High
Dust control	Low	High	High
Noise reduction	Low	High	High

Source: NRCS Planning & Design Manual, NRCS

British Columbia shrub species which lend themselves to buffer zone application are:

- ⇒ Red Osier Dogwood
- ⇒ Yellow Twig Dogwood
- ⇒ Beaked Hazelnut
- ⇒ Wolf-willow/Silverberry
- ⇒ Ocean Spray
- ⇒ Twinberry
- ⇒ Tall Oregon Grape
- ⇒ California Lilac
- ⇒ California Waxmyrtle
- ⇒ Indian Plum/Oso Berry
- ⇒ Sitka Alder
- ⇒ Smooth Sumac
- ⇒ Red Flowering Currant
- ⇒ Nootka Rose
- ⇒ Snowberries
- ⇒ Thimbleberry
- ⇒ Salmonberry

Maintenance

- Little or none required except in the case of newly planted material, which will need adequate water (and perhaps fertilizer) until established.
- Simple pruning of bushes and trees will produce a thicker, sturdier growth.

Sources

United States Department of Agriculture and Mississippi State University. (1999): **Riparian Buffer Zone;** in Water Related BMP's in the Landscape/Best Management Practices/Stream System Protection/C. Stream Bank Protection and Restoration/. *Watershed Science Institute United States Department of Agriculture and Mississippi State University,* <http://abe.msstate.edu/csd/NRCS-BMPs/contents.html>, October 2001.

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