H2O Environmental Master TAG Catalogue

Version 5.1 · 20261107 · DRAFT

Practical Environmental Solutions | Master searchable TAG definitions and specialist Sediment assessment

Version 5.1 — change summary

The original V4 contains 104 searchable main TAG records. This draft retains 94 main TAG records following consolidation of eleven overlapping sediment-titled records into one principal Sediment TAG (H2O-031). Four numbered sub-assessments appear under that principal TAG, but do not count as additional TAGs or photograph crosshairs. V5.1 revises H2O-001 from the broader “Marsh” to “Tidal Marsh” to distinguish tidal wetland habitat from individual salt-grass vegetation. All 94 numbered TAG entries and H2O-031 subsections retain their identifiers and order.

Existing non-sediment entries retain their Version 4 educational descriptions. Ten former sediment-titled IDs become deprecated search aliases with an explicit migration mapping. Original stable IDs are retained for the remaining records; the new numeric display numbers are sequential and must not be used to rewrite historical inspections.

Master categories and counts

Category	Main TAGs
Vegetation	15
Landform	15
Sediment / Soil	6
Hydrology	12
Inputs	10
Restrictions	11
Receiving Environment	10
Visible Condition / Process	15
TOTAL	94

Sequential master index (all 94 main TAGs)

Vegetation

Number	TAG title	Layer
H2O-001	Tidal Marsh	LTAG
H2O-002	Mangrove	LTAG
H2O-003	Reed	LTAG
H2O-004	Rush	LTAG
H2O-005	Wetland Grass	LTAG
H2O-006	Salt Grass	LTAG
H2O-007	Native Bush	LTAG
H2O-008	Kahikatea	LTAG
H2O-009	Mixed Wetland Vegetation	LTAG
H2O-010	Tussock	LTAG
H2O-011	Scrub	LTAG
H2O-012	Pine Forest	LTAG
H2O-013	Cut Forestry	LTAG
H2O-014	Bare Ground	LTAG
H2O-015	Vegetation Edge	LTAG

Landform

Number	TAG title	Layer
H2O-016	Flat Basin	LTAG
H2O-017	Valley Floor	LTAG
H2O-018	Gentle Slope	LTAG
H2O-019	Steep Slope	LTAG
H2O-020	Ridge	LTAG
H2O-021	Terrace	LTAG
H2O-022	Depression	LTAG
H2O-023	Channel Bed	LTAG
H2O-024	Channel Bank	LTAG
H2O-025	Floodplain	LTAG
H2O-026	Tidal Flat	LTAG

H2O-027	Coastal Margin	LTAG
H2O-028	Cliff Face	LTAG
H2O-029	Rolling Ground	LTAG
H2O-030	Undulating Ground	LTAG

Sediment / Soil

Number	TAG title	Layer
H2O-031	Sediment	TAG
H2O-032	Sand	LTAG
H2O-033	Mud	LTAG
H2O-034	Peat	LTAG
H2O-035	Clay	LTAG
H2O-036	Shell Deposit	LTAG

Hydrology

Number	TAG title	Layer
H2O-037	River Flow	LTAG
H2O-038	Tidal Flow	LTAG
H2O-039	Groundwater Seep	LTAG
H2O-040	Stormwater Discharge	LTAG
H2O-041	Pipe Outfall	LTAG
H2O-042	Culvert Flow	LTAG
H2O-043	Surface Runoff	LTAG
H2O-044	Ponded Water	LTAG
H2O-045	Stagnant Water	LTAG
H2O-046	Channel Flow	LTAG
H2O-047	Baseflow	LTAG
H2O-048	Backwater	LTAG

Inputs

Number	TAG title	Layer

H2O-049	Stormwater Catchment	LTAG
H2O-050	Tributary Stream	LTAG
H2O-051	River Inflow	LTAG
H2O-052	Forestry Runoff	LTAG
H2O-053	Road Runoff	LTAG
H2O-054	Agricultural Runoff	LTAG
H2O-055	Groundwater Input	LTAG
H2O-056	Tidal Inflow	LTAG
H2O-057	Drain Discharge	LTAG
H2O-058	Wetland Discharge	LTAG

Restrictions

Number	TAG title	Layer
H2O-059	Bridge Crossing	LTAG
H2O-060	Culvert Restriction	LTAG
H2O-061	Weir	LTAG
H2O-062	Flap Valve	LTAG
H2O-063	Wastop Valve	LTAG
H2O-064	Pier Structure	LTAG
H2O-065	Valley Narrowing	LTAG
H2O-066	Hard Bank Protection	LTAG
H2O-067	Revetment	LTAG
H2O-068	Rock Armouring	LTAG
H2O-069	Vegetation Blockage	LTAG

Receiving Environment

Number	TAG title	Layer
H2O-070	River Channel	LTAG
H2O-071	Estuary Margin	LTAG
H2O-072	Tidal Inlet	LTAG
H2O-073	Harbour Basin	LTAG

H2O-074	Coastal Beach	LTAG
H2O-075	Surf Zone	LTAG
H2O-076	Intertidal Flat	LTAG
H2O-077	Shellfish Bed	LTAG
H2O-078	Open Harbour	LTAG
H2O-079	Ocean Discharge	LTAG

Visible Condition / Process

Number	TAG title	Layer
H2O-080	Mud	TAG
H2O-081	Sand	TAG
H2O-082	Organic	TAG
H2O-083	Forestry Slash	TAG
H2O-084	Debris	TAG
H2O-085	Slip	TAG
H2O-086	Bank Collapse	TAG
H2O-087	Scour	TAG
H2O-088	Stagnant Water	TAG
H2O-089	Ponding	TAG
H2O-090	Algae Bloom	TAG
H2O-091	Surface Sheen	TAG
H2O-092	Plume	TAG
H2O-093	Debris Transport	TAG
H2O-094	Clear Water	TAG

Specialist TAG: H2O-031 · Sediment

Stable identifier: TAG-SEDIMENT | Category: Sediment / Soil | One image crosshair | One overall LUIS score

Short description

Sediment is loose mineral or organic particulate material, including gravel, sand, silt, clay, shell fragments and plant-derived matter. It can be eroded, carried, deposited and reworked by water, waves, wind or gravity.

Show more

Sediment is a natural component of catchments, rivers, estuaries and coastal environments. Its composition, origin and behaviour vary with geological material, biological processes, water energy and chemistry. Sand and gravel commonly move along beds, while finer particles can remain suspended, form aggregates or settle in low-energy settings. Accumulation builds landforms and habitats, but changes in supply, storage, grain size or chemical constituents may affect ecological conditions. A sediment observation alone does not determine whether the material is harmful. For scientific interpretation, record material characteristics, source and history, transport, and deposition separately, supported by photographs, sample records and measurements where available.

Linked independent deep dive

Sedimentation: Independent Scientific and Evidence Review V2.0 (20261107). Publication URL to be added when BNet hosts the approved PDF.

Compact sub-assessment — two rows per section

Each section uses a horizontal row of click-to-highlight options and a second, full-width optional comment row. Multiple options may be selected. “?” means not established and is exclusive of other choices within the same section. All four sections are available but may be left incomplete and revisited.

H2O-031-01 · Material

Selection row	Clickable options
H2O-031-01 · Material	Gravel | Sand | Silt | Clay | Organic | Shell | Mixed | ?
Comment	Optional material observation or sample note

H2O-031-02 · Source & history

Selection row	Clickable options
H2O-031-02 · Source & history	Hillside / slip | Riverbank erosion | Legacy deposit | Catchment runoff | Coastal / tidal | ?
Comment	Optional source/history observation

H2O-031-03 · Transport

Selection row	Clickable options
H2O-031-03 · Transport	Normal flow | High flow | Flood | Tidal flow | Wave action | ?
Comment	Optional transport observation; explain inferred mechanisms

H2O-031-04 · Deposition & storage

Selection row	Clickable options
H2O-031-04 · Deposition & storage	Channel bed | Bank / bar | Floodplain | Intertidal flat | Channel infilling | ?
Comment	Optional deposition/storage observation

Linked photographs and sample references

Attach existing or new project images of the ground, bank, core sample, jar-test stages, laboratory results or handwritten notes. A photograph can support more than one subsection without being duplicated. For each photographed jar sequence, record the unique sample number, shaking procedure, elapsed settling time and the linked image reference. Do not require a separate tick-list of evidence types.

Full TAG definitions — V5.1

Vegetation

H2O-001 · Tidal Marsh

ID: LTAG-VEGETATION-MARSH | LTAG

Short description: Tidal marsh is a coastal wetland periodically flooded by seawater or brackish tides. It supports communities of salt-tolerant grasses, rushes, sedges, herbs and shrubs; it is a habitat, not a single grass species.

Show more: Tidal marsh occurs along sheltered estuaries and coastal margins where the rise and fall of tides regularly wet the ground. Its vegetation may include oioi, sea rush, saltmarsh ribbonwood, sedges and other salt-tolerant plants, depending on salinity, elevation, sediment, freshwater inflow and exposure. The marsh is a living habitat: its plants, roots, soils, tidal creeks and associated wildlife function together. Vegetation can trap sediment, reduce erosion and provide shelter and feeding areas for birds, fish and invertebrates. Changes in tidal exchange, ground level or sediment supply can alter the plant community. Record the observed vegetation and tidal setting; do not assume that any grass-like plant beside an estuary is a particular salt-grass species. Freshwater marsh is a separate environment and is not included in this TAG.

H2O-002 · Mangrove

ID: LTAG-VEGETATION-MANGROVE | LTAG

Short description: Mangroves are salt-tolerant woody trees or shrubs growing on sheltered tidal shores. In New Zealand they have green oval leaves and often form dense stands above muddy ground.

Show more: New Zealand mangroves are usually the native species Avicennia marina subsp. australasica, often called mānawa. They grow in sheltered estuaries, harbours and tidal creeks where seawater regularly covers the roots. Their spreading root systems include upward-pointing breathing roots called pneumatophores, visible around the trunks at low tide. Mangroves tolerate salty, waterlogged sediment and can trap fine particles among their roots. Their leaves and branches provide shelter and food pathways for estuarine life. Trees may be short and bushy in exposed or cooler places and taller where conditions are sheltered and favourable.

H2O-003 · Reed

ID: LTAG-VEGETATION-REED | LTAG

Short description: Reeds are tall, narrow-leaved wetland plants with upright, often hollow or firm stems. They commonly grow in dense groups at the margins of slow or shallow water.

Show more: Reed beds often form a nearly continuous stand of long, strap-like leaves and flowering stems. Many reeds spread through underground rhizomes and can survive in wet, silty or periodically flooded soil. Their stems move in the wind while the roots remain anchored in the sediment. Reeds occur around ponds, lakes, drains, waterways and marshes. Several different plant species are commonly called reeds, so the name describes an appearance rather than always identifying one species. Their growth can

provide shelter for wetland wildlife and alter how water moves through a vegetated margin.

H2O-004 · Rush

ID: LTAG-VEGETATION-RUSH | LTAG

Short description: Rushes are grass-like wetland plants with slender, generally round or stiff stems growing in clumps. They are common on damp flats and along stream, pond or estuary edges.

Show more: Rushes differ from many grasses in having less conspicuous leaves and often upright cylindrical stems. Many species belong to the genus Juncus, although similar-looking plants can belong to other groups. They are adapted to soils that are wet for part or all of the year. Small flowers and seeds may appear in clusters on the stems. Different rush species tolerate different combinations of fresh water, salt and seasonal drying. Rush clumps can create small sheltered spaces for insects and animals and contribute plant material to wetland soils.

H2O-005 · Wetland Grass

ID: LTAG-VEGETATION-WETLAND-GRASS | LTAG

Short description: Wetland grasses are grass species growing where the ground remains damp or is repeatedly flooded. They have narrow leaves and may form lawns, tussocks or taller stands.

Show more: These grasses occupy the transition between open water, saturated soil and drier land. Their roots and shoots are adapted to varying periods of waterlogging, and different species tolerate different flood frequencies. Some spread by creeping stems; others develop dense clumps. The term refers to the habitat and general form rather than one botanical species. Wetland grasses can stabilise the surface of soft soil, provide food and cover for animals, and produce plant litter that joins the wetland’s organic material.

H2O-006 · Salt Grass

ID: LTAG-VEGETATION-SALT-GRASS | LTAG

Short description: Salt grass refers to low-growing, salt-tolerant grass-like vegetation found on saline soils, especially around tidal margins and saltmarsh. It may form short lawns or spreading mats.

Show more: Salt-tolerant grasses survive conditions that would damage many ordinary pasture grasses. They grow where tidal saltwater, salty groundwater or sea spray

influences the soil. Their leaves may be tough or narrow, and some spread by runners or underground stems. Salt grass often occurs with glasswort, rushes and other saltmarsh plants. The exact species and vegetation height vary with climate, salinity, ground elevation and how frequently the area is covered by the tide. A salt-grass patch is not necessarily the same as the whole saltmarsh habitat.

H2O-007 · Native Bush

ID: LTAG-VEGETATION-NATIVE-BUSH | LTAG

Short description: Native bush is an area dominated by naturally occurring New Zealand trees, shrubs, ferns and other forest plants. Its appearance ranges from low regenerating scrub to tall layered forest.

Show more: Native bush commonly has multiple plant layers: taller canopy trees, smaller trees, shrubs, ferns, climbers and ground plants. The mix varies greatly between coastal, lowland, wetland and upland settings. Forest litter accumulates on the ground and is broken down by fungi and soil organisms. The vegetation provides shade, habitat and a continuous network of roots and organic matter. Native bush may be mature forest, recovering secondary growth or a small remnant surrounded by developed land; these have different structures and species compositions.

H2O-008 · Kahikatea

ID: LTAG-VEGETATION-KAHIKATEA | LTAG

Short description: Kahikatea is a tall native New Zealand conifer with a straight trunk and a narrow crown when mature. It is especially associated with lowland forests and wet or poorly drained ground.

Show more: Kahikatea (Dacrycarpus dacrydioides) can grow into one of New Zealand’s tallest native trees. Young trees often have fine, flattened foliage, while older trees develop more open crowns and tall trunks. In swamp forests, its roots may spread over wet soils and develop raised buttressed bases. Kahikatea forests once covered large areas of lowland floodplain and wetland country. The tree produces small seeds associated with fleshy structures eaten by birds. It can also occur in drier forest, but wet lowland settings are particularly characteristic.

H2O-009 · Mixed Wetland Vegetation

ID: LTAG-VEGETATION-MIXED-WETLAND-VEGETATION | LTAG

Short description: Mixed wetland vegetation is a patch containing several kinds of water-tolerant plants rather than one dominant type. Grasses, rushes, reeds, shrubs and small trees may grow together.

Show more: Wetlands frequently contain a mosaic of plant forms because water depth, soil type, nutrient supply and salinity vary over short distances. Taller vegetation may occupy slightly raised ground while lower plants live where flooding lasts longer. The mixture changes over seasons and through longer-term ecological succession. A mixed stand can contain native and introduced species and may include both freshwater and salt-tolerant plants in transitional zones. This name describes the combined plant cover without requiring every species in the patch to be identified.

H2O-010 · Tussock

ID: LTAG-VEGETATION-TUSSOCK | LTAG

Short description: Tussock describes grasses or grass-like plants growing in distinct dense bunches, often with long arching leaves. The bunches stand above surrounding soil or shorter vegetation.

Show more: Tussocks form from many leaves and shoots rooted close together, sometimes making raised mounds as dead leaves accumulate around the base. They occur in coastal dunes, wetlands, grasslands and upland environments, depending on the species. Their leaves may be fine, coarse, stiff or drooping. Spaces between tussocks can remain relatively open or be filled with smaller plants. The term describes the tufted growth form; many different plants, including sedges and native grasses, can make tussock-like clumps.

H2O-011 · Scrub

ID: LTAG-VEGETATION-SCRUB | LTAG

Short description: Scrub is land covered mainly by low to medium-height shrubs and young woody plants rather than tall, closed-canopy forest. It can be dense or patchy.

Show more: Scrub often develops after vegetation clearance, fire, grazing changes or disturbance, but it can also be a natural vegetation type in exposed places. A patch may contain mānuka, kānuka, coastal shrubs, gorse, blackberry or other species depending on the site. Shrubs generally have several branches from low on the stem and provide a more open canopy than mature forest. Scrub can change gradually into taller woodland or forest, or remain low where wind, salt, soils or repeated disturbance limit tree growth.

H2O-012 · Pine Forest

ID: LTAG-VEGETATION-PINE-FOREST | LTAG

Short description: Pine forest is a stand dominated by pine trees, commonly radiata pine in New Zealand. The trees have needle-like leaves and woody cones and may be planted in regular rows.

Show more: Radiata pine plantations are widespread in New Zealand and are generally managed for timber. Mature stands form a high, often fairly uniform canopy above a floor of fallen needles, branches and other vegetation. Young plantations look quite different, with smaller trees and more sunlight reaching the ground. Pine stands may also establish naturally outside plantations. The density of ground vegetation and exposed soil depends on age, management and terrain. Roots, litter and forest roads together influence how rainwater moves through a forested catchment.

H2O-013 · Cut Forestry

ID: LTAG-VEGETATION-CUT-FORESTRY | LTAG

Short description: Cut forestry is land where a stand of production trees has recently been felled or harvested. It often shows stumps, exposed soil, branches, logs and tracks.

Show more: After timber harvesting, the former tree canopy is largely absent and the ground may contain felled wood, bark, needles, stumps and machinery routes. The appearance varies with harvesting methods and the time since cutting. Some slopes retain patches of understorey vegetation while others have extensive disturbed ground. Over months and years, grasses, shrubs or planted young trees may become established. The term describes a stage in the forestry land-cover cycle, not a particular soil condition or a measurement of material moving off the site.

H2O-014 · Bare Ground

ID: LTAG-VEGETATION-BARE-GROUND | LTAG

Short description: Bare ground is an area with little or no living vegetation cover, exposing soil, sand, gravel, rock or other surface material.

Show more: Bare ground may occur naturally on riverbeds, tidal flats, dunes and rocky slopes or result from cultivation, building activity, traffic, vegetation loss or recent earthworks. Its texture and colour depend on the exposed material. Some bare surfaces are stable for long periods, while others change with wind, rain, tides or flowing water. A patch can contain loose particles, compacted soil or exposed bedrock. The absence of plants alone does not show why the surface is bare or whether erosion is taking place.

H2O-015 · Vegetation Edge

ID: LTAG-VEGETATION-VEGETATION-EDGE | LTAG

Short description: A vegetation edge is the visible boundary between a plant-covered area and a different surface or plant community. It can be sharp or gradually changing.

Show more: Edges occur where forest meets grassland, saltmarsh meets mudflat, or a reed bed meets open water. Some form because of a change in soil moisture, elevation, salinity or light. Others reflect mowing, planting, grazing, excavation or other land use. A natural transition may contain overlapping plant species and irregular outlines, while a maintained boundary can be straight and abrupt. Vegetation edges can move over time as plants establish, die back or respond to changing local conditions.

Landform

H2O-016 · Flat Basin

ID: LTAG-LANDFORM-FLAT-BASIN | LTAG

Short description: A flat basin is a broad, low-lying area with little surface slope and higher ground around at least part of it. Water and fine material may collect in its lower parts.

Show more: Basins occur where the landscape forms a shallow bowl or broad depression. Rainfall, stream flows or groundwater can enter from surrounding ground, and the basin may drain slowly if its outlet is high or restricted. Some basins have permanent lakes or wetlands; others remain dry except after heavy rain. Fine sediment often accumulates in quiet-water parts over long periods. Their size ranges from small hollows to large valley-floor landscapes.

H2O-017 · Valley Floor

ID: LTAG-LANDFORM-VALLEY-FLOOR | LTAG

Short description: A valley floor is the lower ground between surrounding slopes or hills, often following the line of a stream or river.

Show more: Valley floors can be narrow and steep-sided or broad and almost level. They commonly contain stream channels, floodplains, deposited sediment, wetlands and paths for groundwater movement. The surface has usually been shaped over time by erosion from surrounding slopes and deposition by flowing water. Some valley floors are dry for much of the year; others flood seasonally. A valley floor is the overall low-lying landform, not just the channel carrying water through it.

H2O-018 · Gentle Slope

ID: LTAG-LANDFORM-GENTLE-SLOPE | LTAG

Short description: A gentle slope is land rising or falling gradually over a distance, without a sharp change in height.

Show more: On a gentle slope, water can flow downhill across the surface, but the gradient is relatively low compared with steep hillsides. Soil, grasses, trees or built surfaces may cover the ground. The slope may be nearly uniform or contain small hollows and rises that alter drainage paths. Gentle slopes occur on foothills, farmland, terraces and coastal land. The term describes the shape of the ground rather than its stability or the rate of runoff.

H2O-019 · Steep Slope

ID: LTAG-LANDFORM-STEEP-SLOPE | LTAG

Short description: A steep slope is ground that rises or falls sharply over a short horizontal distance. It is common on hillsides, gully walls and valley sides.

Show more: Steep ground is influenced strongly by gravity, and loose soil or rock can move downslope when support is lost or the material becomes unstable. Surface water may follow concentrated paths or run quickly over exposed sections. Trees and other vegetation can occupy steep slopes, sometimes with roots anchored in thin soils. Some steep slopes are natural and long-standing, while others are created by excavation or changes in the landscape. Steepness alone does not prove that a slip or erosion is occurring.

H2O-020 · Ridge

ID: LTAG-LANDFORM-RIDGE | LTAG

Short description: A ridge is a long, raised line of ground with slopes falling away on either side. It often forms the boundary between neighbouring drainage areas.

Show more: Ridges occur along hilltops, mountain spurs and the edges of valleys. Rain falling on opposite sides generally travels towards different gullies or streams, so a ridge can mark a watershed. The crest may be narrow and sharp or broad and rounded. Wind exposure, soils and vegetation often differ from conditions lower on adjacent slopes. A ridge is defined by its position in the landform rather than by its height above sea level.

H2O-021 · Terrace

ID: LTAG-LANDFORM-TERRACE | LTAG

Short description: A terrace is a relatively level step of land bordered by a steeper slope or bank. Terraces commonly occur beside rivers and along coasts.

Show more: River terraces can represent older floodplain levels left above a channel as the river cuts down into its deposits. Coastal terraces can relate to former shorelines or changing sea levels, while some terraces have been made by people. A terrace usually has a flat or gently sloping surface and a clearer edge where the ground drops to the next level. Its soil and sediment can preserve evidence of earlier water movement and landscape history.

H2O-022 · Depression

ID: LTAG-LANDFORM-DEPRESSION | LTAG

Short description: A depression is a local low point or hollow in the ground compared with the surrounding surface. It may be dry, damp or water-filled.

Show more: Depressions range from shallow dips to deep enclosed hollows. They may form through natural settlement, erosion, old channels, ground movement or earthworks. Water can gather in a depression after rain if it cannot readily escape, and fine sediment or organic matter may settle there. Some depressions connect to streams or drains; others have no visible surface outlet. The term describes ground shape, not necessarily a permanent pond or a drainage defect.

H2O-023 · Channel Bed

ID: LTAG-LANDFORM-CHANNEL-BED | LTAG

Short description: A channel bed is the bottom surface of a river, stream, drain or tidal channel, beneath flowing or periodically flowing water.

Show more: A bed may consist of boulders, gravel, sand, silt, mud, rock or mixtures of these materials. Its surface can be smooth, rippled, stepped or irregular. Water moving over the bed can carry particles, erode material or deposit new layers. The bed may be exposed during low flow or low tide and covered at other times. Channel-bed levels and materials often vary along a watercourse and can change after floods or storms.

H2O-024 · Channel Bank

ID: LTAG-LANDFORM-CHANNEL-BANK | LTAG

Short description: A channel bank is the sloping or near-vertical side of a watercourse, separating the channel bed from the surrounding ground.

Show more: Banks may be made of soil, sand, gravel, clay, rock or deposited layers and may support grass, shrubs or trees. A bank can be gently graded or very steep, and its shape is affected by water movement, roots, sediment properties and local ground conditions. Erosion and deposition can change a bank's position over time. Natural stream banks may have undercut sections, exposed roots or shelves; engineered banks may contain stone, concrete or timber.

H2O-025 · Floodplain

ID: LTAG-LANDFORM-FLOODPLAIN | LTAG

Short description: A floodplain is low land beside a river or stream that can be covered by water when flows rise above the normal channel.

Show more: Floodplains are commonly formed by repeated flooding and deposition of sand, silt and other material. Their surfaces may contain old channels, wet hollows, natural levees, pastures, wetlands or buildings. Floodwater can spread across a floodplain, slow down, and leave sediment as levels fall. Not every part floods equally often. Floodplains connect river channels with surrounding land and are part of a river's broader physical system, even where they are normally dry.

H2O-026 · Tidal Flat

ID: LTAG-LANDFORM-TIDAL-FLAT | LTAG

Short description: A tidal flat is a broad, low-gradient area of sand or mud that is covered at higher tides and exposed at lower tides.

Show more: Tidal flats are common inside sheltered harbours and estuaries where waves and currents allow sediment to accumulate. The surface may be soft mud, firm sand or a mixture, and it may show ripples, shallow channels, shells and small animal burrows. Worms, shellfish, crabs and microorganisms live within or on the sediment. The length of time the flat is underwater depends on its elevation and the tidal cycle. Tidal flats may change shape as currents, storms and sediment supply vary.

H2O-027 · Coastal Margin

ID: LTAG-LANDFORM-COASTAL-MARGIN | LTAG

Short description: The coastal margin is the land and shallow-water edge where terrestrial and marine environments meet. It includes beaches, dunes, cliffs and estuary shores.

Show more: Coastal margins are influenced by waves, tides, salt spray, wind and land drainage. They can consist of sand, gravel, rock, muddy sediment, vegetation or built shoreline structures. The precise boundary moves with tides and weather and may change over longer periods through erosion or deposition. Some coastal margins are exposed to strong ocean waves, while sheltered estuarine shores experience gentler water movement. The term covers the transition zone rather than one specific landform.

H2O-028 · Cliff Face

ID: LTAG-LANDFORM-CLIFF-FACE | LTAG

Short description: A cliff face is a steep, exposed wall of rock, soil or sediment, commonly along a coast, river valley or hillside.

Show more: Cliffs can be nearly vertical or strongly sloping and may show visible layers, joints, cracks and ledges. They form through processes including wave erosion, river cutting, weathering and ground movement. Some cliffs are made of solid rock; others are softer deposits such as sand, clay or volcanic ash. Small falls of material or larger failures can change their shape. Vegetation may grow on ledges and along the top or bottom, depending on the material and moisture.

H2O-029 · Rolling Ground

ID: LTAG-LANDFORM-ROLLING-GROUND | LTAG

Short description: Rolling ground is a landscape of repeated broad, rounded hills and shallow valleys, without sharp or very steep relief.

Show more: A rolling landscape has a sequence of smooth rises and dips rather than one continuous slope. It often occurs on weathered sedimentary hills, pastureland and low uplands. Surface water runs from hill crests towards the small valleys between them, sometimes forming a network of minor drainage paths. The rounded form can reflect long periods of erosion and soil development. Individual slopes may be gentle or moderately steep, but the overall appearance is softly undulating.

H2O-030 · Undulating Ground

ID: LTAG-LANDFORM-UNDULATING-GROUND | LTAG

Short description: Undulating ground is land with a gentle succession of small rises and dips. It is usually less strongly hilly than rolling ground.

Show more: Undulations may be only a few metres across or extend over broad areas. Small changes in height can create different moisture conditions, with drier rises and

wetter hollows. The surface may be covered with grass, scrub, forest or exposed soil. The term is descriptive and does not identify the geological process that formed the land. Undulating ground can be natural or altered by activities such as earthworks or past farming.

Sediment / Soil

H2O-031 · Sediment

ID: TAG-SEDIMENT | TAG

Short description: Sediment is loose mineral or organic particulate material, including gravel, sand, silt, clay, shell fragments and plant-derived matter. It can be eroded, carried, deposited and reworked by water, waves, wind or gravity.

Show more: Sediment is a natural component of catchments, rivers, estuaries and coastal environments. Its composition, origin and behaviour vary with geological material, biological processes, water energy and chemistry. Sand and gravel commonly move along beds, while finer particles can remain suspended, form aggregates or settle in low-energy settings. Accumulation builds landforms and habitats, but changes in supply, storage, grain size or chemical constituents may affect ecological conditions. A sediment observation alone does not determine whether the material is harmful. For scientific interpretation, record material characteristics, source and history, transport, and deposition separately, supported by photographs, sample records and measurements where available.

Specialist assessment: H2O-031-01 Material, H2O-031-02 Source & history, H2O-031-03 Transport, H2O-031-04 Deposition & storage. See Sediment section above.

H2O-032 · Sand

ID: LTAG-SEDIMENT-SOIL-SAND | LTAG

Short description: Sand is loose mineral grains larger than silt but smaller than gravel, usually noticeable as separate gritty particles. It is common on beaches, dunes and riverbeds.

Show more: Sand grains generally range from about 0.063 to 2 millimetres across. They may be made of quartz, shell fragments, volcanic minerals or other rock particles. Dry sand usually feels gritty and runs between fingers; wet sand can hold a temporary shape. Moving water and wind sort sand into layers, bars, ripples and dunes. Grain size, shape and composition vary between locations. Some sand is clean and pale, while other deposits are dark or mixed with mud and organic matter.

H2O-033 · Mud

ID: LTAG-SEDIMENT-SOIL-MUD | LTAG

Short description: Mud is wet, soft sediment made mostly of fine particles such as silt and clay, often mixed with organic matter. It is common on sheltered tidal flats and wet ground.

Show more: Mud forms where fine suspended material settles and mixes with water. It may be smooth and sticky or soft enough for footprints to sink into. Dark-coloured mud can contain decomposing plants and other organic material; some mud has a noticeable sulphurous smell when oxygen is limited. Mud surfaces may contain small channels, shells, burrows and plant roots. As mud dries it can become firmer or crack. Not all mud has the same composition, consistency or environmental history.

H2O-034 · Peat

ID: LTAG-SEDIMENT-SOIL-PEAT | LTAG

Short description: Peat is a dark, organic soil formed by the slow accumulation of partly decomposed plants in persistently wet conditions. It is often spongy or fibrous.

Show more: Peat develops where plants produce organic matter faster than microorganisms can fully break it down, commonly because the soil remains saturated and has little available oxygen. It may contain recognisable roots, mosses, leaves and wood. Peat deposits can be shallow or many metres thick and may hold large amounts of water. When drained, peat can dry, shrink and oxidise. Peat forms over long periods and can preserve evidence of earlier vegetation and wetland conditions.

H2O-035 · Clay

ID: LTAG-SEDIMENT-SOIL-CLAY | LTAG

Short description: Clay is extremely fine-grained mineral material that is often smooth and plastic when wet and can become hard when dry.

Show more: Clay particles are smaller than about 0.002 millimetres and have a large surface area for their size. Many clay-rich soils feel sticky when wet, can be moulded, and may crack as they dry. Different clay minerals swell and shrink to differing degrees. Clay is commonly found mixed with silt, sand and organic matter rather than as a completely pure deposit. Its low permeability can slow the movement of water through some soils. Clay-rich layers may form distinct bands in exposed banks or sediment cores.

H2O-036 · Shell Deposit

ID: LTAG-SEDIMENT-SOIL-SHELL-DEPOSIT | LTAG

Short description: A shell deposit is an accumulation of whole shells, broken shell pieces or shell-rich sediment left by marine or freshwater animals.

Show more: Shell deposits occur on beaches, tidal flats, estuary margins and former shorelines. They may contain clams, cockles, oysters, pipi or other mollusc remains, depending on the setting. Some accumulate where animals lived; others have been moved and concentrated by tides, waves or currents. A deposit may consist almost entirely of shell fragments or be mixed with sand and mud. Shell layers can record past habitat conditions, but their age and origin are not always obvious from appearance alone.

Hydrology

H2O-037 · River Flow

ID: LTAG-HYDROLOGY-RIVER-FLOW | LTAG

Short description: River flow is water moving along a river channel, generally downhill from its catchment towards a lake, estuary or sea.

Show more: River water comes from rainfall, streams, springs, groundwater and sometimes snowmelt. Its speed and depth vary with channel shape, slope, weather and the amount of water entering upstream. Flow may be smooth in deep pools or turbulent over shallow rocks and rapids. A river can also spread over its floodplain during high flows. River flow carries dissolved substances and sediment and provides continuously changing habitats for aquatic organisms.

H2O-038 · Tidal Flow

ID: LTAG-HYDROLOGY-TIDAL-FLOW | LTAG

Short description: Tidal flow is the movement of seawater into and out of coastal channels, estuaries and harbours as sea levels rise and fall.

Show more: Tides result mainly from the gravitational influence of the Moon and Sun. Flood tide generally moves water landward as the sea rises; ebb tide generally carries water seaward as it falls. Currents are affected by channel width, depth, seabed shape, freshwater inflow and nearby shorelines. In some estuaries, tidal water travels far upstream. Tide-related currents can move sand and mud, mix salt and fresh water, and repeatedly cover and uncover intertidal surfaces.

H2O-039 · Groundwater Seep

ID: LTAG-HYDROLOGY-GROUNDWATER-SEEP | LTAG

Short description: A groundwater seep is a place where water slowly emerges from soil, sediment or rock onto the ground surface or into a watercourse.

Show more: Groundwater is water stored in pores and cracks beneath the land. It may emerge as a damp patch, a trickle, a wet bank face or a small spring where the water table meets the surface. Seepage can continue during dry weather if underground water remains available. The flow rate may change with rainfall, seasons and local geology. Seep water can be clear or carry dissolved minerals and fine particles, depending on its pathway.

H2O-040 · Stormwater Discharge

ID: LTAG-HYDROLOGY-STORMWATER-DISCHARGE | LTAG

Short description: Stormwater discharge is rainwater runoff released from land, drains or a built stormwater system into another part of the environment.

Show more: Rain falling on roofs, roads, lawns and other surfaces may soak into the ground, evaporate or run off. Collected runoff can be conveyed through pipes, open drains or channels before reaching land, a stream or coastal water. The discharge rate increases during rain and may fall quickly afterwards, although groundwater and drainage connections can prolong flow. Stormwater can carry leaves, soil, litter and other substances picked up along its route.

H2O-041 · Pipe Outfall

ID: LTAG-HYDROLOGY-PIPE-OUTFALL | LTAG

Short description: A pipe outfall is the open end of a drainage pipe where water leaves the pipe and enters land, a channel, river, estuary or sea.

Show more: Outfalls are often made of concrete, plastic, metal or other pipe materials and may have headwalls, grates or erosion protection. Water can emerge as a trickle, a steady stream or a strong jet depending on conditions upstream. Some outfalls lie above normal water level, while others are submerged at high tide or high river stage. Sediment and vegetation may accumulate around an outlet. The term identifies the physical discharge point, not necessarily the source of the water.

H2O-042 · Culvert Flow

ID: LTAG-HYDROLOGY-CULVERT-FLOW | LTAG

Short description: Culvert flow is water passing through an enclosed passage or pipe beneath a road, path, embankment or other crossing.

Show more: Culverts are commonly circular pipes or rectangular box structures. Water may flow freely with air above it or fill the whole passage during high water levels. The rate depends on channel slope, culvert dimensions, roughness and upstream and downstream conditions. Culverts connect watercourses or drainage channels through barriers such as roads. At their entrances and exits, flow may accelerate, slow or create turbulence and local sediment movement.

H2O-043 · Surface Runoff

ID: LTAG-HYDROLOGY-SURFACE-RUNOFF | LTAG

Short description: Surface runoff is water travelling over the ground when rain or other water input is greater than the amount that can soak into the surface.

Show more: Runoff may form thin sheets moving across a slope or gather into small rills and drains. It is influenced by rainfall intensity, soil moisture, surface cover, slope and the presence of buildings or pavement. Some runoff occurs because the ground is saturated; elsewhere it happens because rainfall falls faster than the soil can absorb it. As water moves, it can pick up loose soil, leaves and other material. Runoff eventually reaches a low point, watercourse, drainage system or area where it infiltrates.

H2O-044 · Ponded Water

ID: LTAG-HYDROLOGY-PONDED-WATER | LTAG

Short description: Ponded water is water temporarily or persistently collected in a low place on land rather than moving away freely.

Show more: Ponding occurs in hollows, flat ground, compacted areas, blocked drainage routes and places where the soil cannot absorb water quickly. The pond may be shallow and short-lived after rain or remain for days or longer. It can also occur near rivers or coasts when downstream water levels prevent drainage. Ponded water differs from a flowing stream because its horizontal movement is usually limited. It may eventually soak away, evaporate or drain when levels elsewhere fall.

H2O-045 · Stagnant Water

ID: LTAG-HYDROLOGY-STAGNANT-WATER | LTAG

Short description: Stagnant water is water that shows little or no noticeable circulation or through-flow over a period of time.

Show more: Stagnant water can occur in isolated pools, blocked channels, abandoned drains and other poorly exchanged areas. Its surface may appear still, although slow underwater movement can be difficult to see. In warm conditions, prolonged residence can allow algae or microorganisms to grow and oxygen levels to change. Leaves and fine sediment may settle on the bottom. The term describes a low-movement water condition; still appearance alone does not establish water quality or how long the water has remained there.

H2O-046 · Channel Flow

ID: LTAG-HYDROLOGY-CHANNEL-FLOW | LTAG

Short description: Channel flow is water moving within a defined natural or artificial channel bounded by a bed and banks or sides.

Show more: Channels include streams, rivers, drains and tidal creeks. Water speed depends on slope, depth, width, roughness and the volume moving through. Flow may be permanent or occur only after rain or during part of the tide. Bends, vegetation, structures and changes in channel width can produce fast and slow areas. Flow in a channel can erode, carry and deposit sediment and may spread onto surrounding land when water levels rise above the banks.

H2O-047 · Baseflow

ID: LTAG-HYDROLOGY-BASEFLOW | LTAG

Short description: Baseflow is the part of stream or river flow that continues between rainfall events, commonly supplied by groundwater or slow drainage from stored water.

Show more: After storm runoff declines, many streams continue flowing because water slowly emerges from aquifers, soils, wetlands and other natural stores. This sustained contribution is called baseflow. Its amount changes through wet and dry seasons and depends on local geology and catchment storage. In dry periods, baseflow can make up most of the water in a stream. Some streams have very little baseflow and may become dry during prolonged rain-free conditions.

H2O-048 · Backwater

ID: LTAG-HYDROLOGY-BACKWATER | LTAG

Short description: Backwater is water held at an unusually high level or moving slowly because downstream water levels obstruct its normal drainage.

Show more: Backwater effects occur where a river meets a high tide, where a downstream channel is full, or where a structure creates a raised water level. Water upstream may rise even without an equivalent increase in local inflow. The current can slow substantially and, in some tidal or connected systems, briefly reverse. Backwater conditions can extend upstream from the point of control and change how sediment settles. The term describes a hydraulic effect rather than a separate source of water.

Inputs

H2O-049 · Stormwater Catchment

ID: LTAG-INPUTS-STORMWATER-CATCHMENT | LTAG

Short description: A stormwater catchment is the area of land from which rainfall runoff drains towards a common stormwater outlet, channel or receiving water.

Show more: Its boundary is shaped by natural slopes and by built features such as roads, kerbs, pipes and drains. Roofs, paved areas, gardens and open ground each contribute water differently. Some water infiltrates or is temporarily stored; the remainder may reach the drainage network. Urban stormwater catchments do not always match natural watershed boundaries because underground pipes can transfer runoff between areas. Their size ranges from a few properties to substantial parts of a town.

H2O-050 · Tributary Stream

ID: LTAG-INPUTS-TRIBUTARY-STREAM | LTAG

Short description: A tributary stream is a smaller watercourse that flows into a larger stream, river or channel.

Show more: Tributaries collect water from their own smaller drainage areas and add it to the main watercourse. They may be permanent, seasonal or intermittent, depending on climate, groundwater and catchment conditions. Tributaries can bring sediment, nutrients, organic matter and aquatic life into the larger system. Where two streams join, differences in flow rate and channel shape may create turbulence and changes in sediment deposition. A tributary is defined by its connection to another watercourse rather than by an absolute size.

H2O-051 · River Inflow

ID: LTAG-INPUTS-RIVER-INFLOW | LTAG

Short description: River inflow is water entering a lake, estuary, harbour or other receiving area from a river.

Show more: River inflows bring freshwater and materials collected from a much wider upstream catchment. Their volume can vary strongly between normal weather and major floods. Where river water meets seawater, differences in salinity and density may create layers and mixing zones. Sediment can settle near the river mouth or travel farther into the receiving water, depending on tides and currents. The inflow location often forms a transition between river and estuarine conditions.

H2O-052 · Forestry Runoff

ID: LTAG-INPUTS-FORESTRY-RUNOFF | LTAG

Short description: Forestry runoff is rainwater draining from land used for forestry, including tree stands, harvested slopes, forest roads and tracks.

Show more: Some rainfall is intercepted by tree canopies or absorbed by forest soils, while the remainder travels over the surface or through shallow drainage paths. Runoff characteristics vary with vegetation cover, soil moisture, road surfaces, harvesting activity and slope. Water can collect material such as needles, bark, leaves and loosened soil. It may reach streams through small gullies, roadside drains or natural channels. The term identifies a land-use source of water, not a fixed water quality or sediment concentration.

H2O-053 · Road Runoff

ID: LTAG-INPUTS-ROAD-RUNOFF | LTAG

Short description: Road runoff is rainwater draining from road pavement, shoulders, verges and connected roadside surfaces.

Show more: Hard surfaces shed water quickly because little rainfall can soak through them. Runoff often follows kerbs, gutters, channels or roadside swales into drains and streams. Water may carry road dust, fine sediment, tyre particles, litter and substances deposited by vehicles. The amount and movement depend on road slope, surface type, traffic-related deposits and rainfall. Road runoff may enter a wider stormwater network or discharge directly from a roadside outlet.

H2O-054 · Agricultural Runoff

ID: LTAG-INPUTS-AGRICULTURAL-RUNOFF | LTAG

Short description: Agricultural runoff is water flowing from land used for grazing, cropping, orchards or other farming activities.

Show more: Rainwater moves across paddocks, tracks and cultivated soils or drains through shallow channels. Conditions differ between pasture, bare cultivated land, compacted stock routes and vegetated margins. Depending on the land use and weather, water can carry soil particles, plant material, nutrients or other farm-related substances. The volume and pathway vary with soil type, slope, rainfall and drainage systems. Agricultural runoff describes where water originates, not a specific measurement of contaminants.

H2O-055 · Groundwater Input

ID: LTAG-INPUTS-GROUNDWATER-INPUT | LTAG

Short description: Groundwater input is water entering a stream, wetland, lake or coastal area from beneath the ground.

Show more: Water stored in the pores of soil and rock can move slowly towards lower pressure areas and emerge through beds, banks, springs or seeps. Groundwater contributions often persist long after rain has stopped, although they may also vary seasonally. Its temperature and dissolved mineral content can differ from nearby surface water. In coastal areas, groundwater movement can be influenced by tides and salinity. The term describes an underground source entering the surface-water system.

H2O-056 · Tidal Inflow

ID: LTAG-INPUTS-TIDAL-INFLOW | LTAG

Short description: Tidal inflow is seawater entering an estuary, harbour, creek or other connected area during the rising phase of the tide.

Show more: As the sea level rises, water advances through inlets and tidal channels and spreads across intertidal flats and low margins. Its speed varies with tidal range, channel geometry and the amount of water that must pass through an opening. Tidal inflow introduces saltwater, redistributes suspended sediment and can mix with freshwater. The process reverses during the ebb tide, when water drains back towards the sea. The volume entering and leaving over a tide is sometimes called the tidal prism.

H2O-057 · Drain Discharge

ID: LTAG-INPUTS-DRAIN-DISCHARGE | LTAG

Short description: Drain discharge is water leaving an open drain, ditch, pipe or connected drainage network at an outlet.

Show more: Drains carry water away from land, roads, fields or other low-lying areas. Some are open channels, while others are pipes beneath the ground. Their discharges may occur only after rain or continue because groundwater enters the system. At the outlet, the water mixes with the receiving stream, wetland or coastal water. The term describes the release point from a drainage route; the water can have several upstream sources.

H2O-058 · Wetland Discharge

ID: LTAG-INPUTS-WETLAND-DISCHARGE | LTAG

Short description: Wetland discharge is water flowing out of a wetland into a stream, drain, lake, river or coastal area.

Show more: Wetlands receive water from rain, groundwater, surface runoff, streams or tides. Water leaving them may pass through a visible outlet channel or seep into surrounding ground. The outflow can vary with water level, season and downstream conditions. Because water may remain among plants and soils for some time, the discharge can differ in temperature, colour and dissolved substances from inflows. Some wetlands have no permanent surface outlet and release water only during wetter periods.

Restrictions

H2O-059 · Bridge Crossing

ID: LTAG-RESTRICTIONS-BRIDGE-CROSSING | LTAG

Short description: A bridge crossing is a structure carrying a road, railway, path or other route over a river, stream, estuary or drainage channel.

Show more: Bridges may span the water without supports in the channel or may contain piers and abutments. Their openings have different shapes and widths, and the bridge deck lies above the water at varying heights. During high flows, water may pass rapidly around structural elements, while floating material can gather against them. A bridge is part of the built environment surrounding a channel; some crossings have little effect on normal flow and others narrow the available passage.

H2O-060 · Culvert Restriction

ID: LTAG-RESTRICTIONS-CULVERT-RESTRICTION | LTAG

Short description: A culvert restriction occurs when a culvert limits the passage of water through a channel, often because of its size, shape, position or obstruction.

Show more: A culvert is a pipe or box-like passage beneath a crossing. When it is narrower than the approaching channel or partly blocked by sediment, branches or other material, water can build up on the upstream side. Inlet and outlet shape and downstream water levels also influence the flow. The restriction may be most noticeable during heavy rainfall. This term describes the hydraulic limiting effect rather than the culvert structure alone.

H2O-061 · Weir

ID: LTAG-RESTRICTIONS-WEIR | LTAG

Short description: A weir is a low barrier built across a channel or watercourse over which water spills when the upstream level is high enough.

Show more: Weirs may be made of concrete, rock, timber or metal and can have fixed crests or adjustable sections. They are used to control upstream water levels, measure flow or manage water movement. Water flowing over a weir often forms a shallow falling sheet or turbulent downstream pool. Sediment may settle upstream where current slows. Some weirs include openings or fish-passage features. Their influence depends on height, geometry and the water levels on each side.

H2O-062 · Flap Valve

ID: LTAG-RESTRICTIONS-FLAP-VALVE | LTAG

Short description: A flap valve is a hinged cover fitted to a pipe or drain outlet that opens under outward flow and closes when water pressure comes from the receiving side.

Show more: The flap is normally mounted at the downstream end of a drainage pipe or structure. When water inside the pipe pushes outward strongly enough, the flap swings open and releases it. If tidewater or river water rises outside, pressure pushes the flap towards its seat, helping stop backflow. Flap valves can be metal, plastic or other durable materials. Their movement depends on the hinge, pressure difference and any debris or sediment around the opening.

H2O-063 · Wastop Valve

ID: LTAG-RESTRICTIONS-WASTOP-VALVE | LTAG

Short description: A Wastop valve is a proprietary flexible one-way valve fitted within a pipe to allow water out while resisting flow back into the pipe.

Show more: Wastop is a trade name for a membrane-style non-return valve. The flexible sleeve or membrane opens when sufficient pressure acts in the permitted flow direction,

then closes against reverse pressure. Such valves are used in drainage and sewer systems where backflow from a receiving water body is a concern. They differ from a conventional hinged flap valve because the moving element is a flexible internal membrane. Valve performance depends on its size, installation and hydraulic conditions.

H2O-064 · Pier Structure

ID: LTAG-RESTRICTIONS-PIER-STRUCTURE | LTAG

Short description: A pier structure is a built support or platform extending into or across water, often supported by columns, piles or solid foundations.

Show more: Piers may support bridges, jetties, wharves or other structures. Their elements occupy space within the water and can change local current speed and direction. Flow may accelerate around supports and slow in sheltered areas behind them. Piles can be made of timber, steel or concrete and may be arranged singly or in groups. The term identifies the physical structure, whether it stands in a river, estuary, harbour or coastal setting.

H2O-065 · Valley Narrowing

ID: LTAG-RESTRICTIONS-VALLEY-NARROWING | LTAG

Short description: Valley narrowing is a place where a valley becomes noticeably narrower, bringing the surrounding slopes or landforms closer together.

Show more: A broad valley may suddenly contract between hills, ridges or resistant rock formations. Streams and floodwater passing through the narrowing have less lateral space available than in the valley upstream or downstream. The constrained area may contain a tight river channel, gorge or built crossing. Sediment deposition and flood patterns can differ around the transition. Valley narrowing is a natural landform description, although earthworks can also create artificial constrictions.

H2O-066 · Hard Bank Protection

ID: LTAG-RESTRICTIONS-HARD-BANK-PROTECTION | LTAG

Short description: Hard bank protection is a constructed surface or structure placed against a river, stream or coastal bank to resist erosion.

Show more: Hard protection can include concrete walls, stone facing, gabion baskets, timber walls or other rigid materials. It generally forms a firm boundary between moving water and the soil behind it. Some installations cover the entire bank, while others protect only the lower toe or a short vulnerable section. Shapes vary from steep

vertical walls to sloped armoured faces. The term groups several engineered methods by their physical role and appearance.

H2O-067 · Revetment

ID: LTAG-RESTRICTIONS-REVETMENT | LTAG

Short description: A revetment is a sloping protective covering placed over a shoreline or bank, commonly using rock, concrete blocks or other durable materials.

Show more: Revetments follow the contour of the bank or coast and provide a protected surface where waves or currents strike. They may contain layers of different sized stones over filter material or geotextile. Unlike a vertical retaining wall, a typical revetment forms an inclined face. Some have large interlocking concrete units, while others use natural rock. Water can pass through voids between stones in certain designs. Revetments are common along coastal margins, canals and riverbanks.

H2O-068 · Rock Armouring

ID: LTAG-RESTRICTIONS-ROCK-ARMOURING | LTAG

Short description: Rock armouring is the placement of large stones or boulders on a bank, bed or shoreline to protect exposed material from moving water.

Show more: Individual rocks are usually much larger than ordinary gravel and can be arranged as a layer or mound. The spaces between them let some water move through the structure. Rock armouring may be placed at bridge supports, culvert outlets, stream banks or shorelines. Its visible character depends on stone size, shape, placement and whether plants have grown between rocks. The term refers specifically to protective rock material rather than all types of hard bank protection.

H2O-069 · Vegetation Blockage

ID: LTAG-RESTRICTIONS-VEGETATION-BLOCKAGE | LTAG

Short description: Vegetation blockage is an accumulation or growth of plants, roots, branches or leaves that partly obstructs a drainage route or watercourse.

Show more: Blockages can be made by living reeds, grasses, shrubs or roots, or by detached plant material carried downstream. They may occur at narrow channels, culvert entrances, grates, valves and other constricted points. A blockage can form a dense mat or a loose tangle, and its extent may change during floods or maintenance. The plants involved may be native or introduced. Vegetation blockage describes a physical obstruction and is not the same as vegetation cover generally.

Receiving Environment

H2O-070 · River Channel

ID: LTAG-RECEIVING-ENVIRONMENT-RIVER-CHANNEL | LTAG

Short description: A river channel is the defined pathway containing the normal flow of a river, with a bed and banks and sometimes islands or bars.

Show more: River channels range from narrow streams to broad waterways and may be straight, meandering or branching. The bed can contain rock, gravel, sand or mud. Flow depth and speed vary from pools to rapids and from ordinary weather to floods. Channels convey water, dissolved material and sediment through a catchment towards a downstream receiving area. Their position and shape can change through erosion and deposition, especially during large flows.

H2O-071 · Estuary Margin

ID: LTAG-RECEIVING-ENVIRONMENT-ESTUARY-MARGIN | LTAG

Short description: An estuary margin is the edge of an estuary where tidal water meets adjacent land, wetlands, banks or shallow flats.

Show more: Estuaries are coastal water bodies where freshwater from land mixes with seawater. Their margins may be muddy, sandy, rocky, vegetated or built up. Many are covered and uncovered by the tide, forming habitats for saltmarsh plants, mangroves, shellfish and other organisms. Small channels and drainage outlets may cross the margin. Conditions vary with tidal height, freshwater inflow, sediment supply, salinity and exposure to wind and waves.

H2O-072 · Tidal Inlet

ID: LTAG-RECEIVING-ENVIRONMENT-TIDAL-INLET | LTAG

Short description: A tidal inlet is a channel or opening that connects the sea or a larger tidal water body with an estuary, lagoon, creek or harbour.

Show more: Water flows through an inlet in opposite directions during flood and ebb tides. The opening may lie between sand spits, dunes, rocky shores or built banks. Inlet width, depth and location can change as waves and tidal currents move sediment. Some inlets are permanently open; others close temporarily when sand accumulates. They provide a connection through which tidal water, salt, suspended particles and aquatic organisms can move.

H2O-073 · Harbour Basin

ID: LTAG-RECEIVING-ENVIRONMENT-HARBOUR-BASIN | LTAG

Short description: A harbour basin is a relatively broad body of sheltered or partly sheltered water within a harbour, bounded by surrounding shores and connected to the sea.

Show more: Harbour basins may contain deeper channels, shallow flats, islands, mud, sand and tidal habitats. Water exchange takes place through harbour entrances and internal channels as tides rise and fall. River inflow and rainfall may create freshwater influence in some parts, while other areas remain mainly marine. Currents and sediment settling vary by depth and shelter. Some basins are natural; others are modified by dredging, reclamation or constructed harbour works.

H2O-074 · Coastal Beach

ID: LTAG-RECEIVING-ENVIRONMENT-COASTAL-BEACH | LTAG

Short description: A coastal beach is a strip of loose sand, gravel, shingle or shell fragments along the edge of the sea.

Show more: Beaches are shaped by breaking waves, tides, wind and sediment supply. They usually have a sloping foreshore and may connect to dunes, cliffs, rocky headlands or estuary mouths. The shoreline moves as material is washed up, carried along the coast or removed during storms. Some beaches are broad and sandy; others are narrow or composed largely of stones and shells. Beach shape can vary substantially through seasons and weather events.

H2O-075 · Surf Zone

ID: LTAG-RECEIVING-ENVIRONMENT-SURF-ZONE | LTAG

Short description: The surf zone is the nearshore band where incoming sea waves break and the water becomes turbulent before reaching the beach.

Show more: The width of the surf zone depends on wave height, seabed slope and water depth. Breaking waves create strong mixing, foam and currents that can move sand along and across the shore. Rip currents may carry water seaward through gaps in the breaking waves. The zone shifts as the tide rises and falls. Surf conditions can change rapidly with wind, swell direction and storms, making it an especially energetic part of the coastal environment.

H2O-076 · Intertidal Flat

ID: LTAG-RECEIVING-ENVIRONMENT-INTERTIDAL-FLAT | LTAG

Short description: An intertidal flat is a relatively level shore surface that lies between typical low- and high-tide water levels and is alternately exposed and submerged.

Show more: Intertidal flats may be composed of mud, sand, gravel, shell fragments or mixtures of these. They support burrowing animals, algae, microorganisms and sometimes seagrass or salt-tolerant plants. Shallow channels often cross the surface as water drains towards deeper tidal waterways. The time available for organisms to feed or remain submerged changes with elevation and tides. This term emphasises the tidal position of the flat, whereas tidal flat is often used as a broader landform name.

H2O-077 · Shellfish Bed

ID: LTAG-RECEIVING-ENVIRONMENT-SHELLFISH-BED | LTAG

Short description: A shellfish bed is an area where shellfish live close together on or within the seabed or intertidal sediment.

Show more: Beds may include cockles, pipi, oysters, mussels or other bivalves depending on salinity, depth, substrate and water movement. Some species burrow into sand or mud, while others attach to hard surfaces. Shellfish filter particles from surrounding water as they feed, and their shells may accumulate after death. Beds can occur in sheltered estuaries, tidal flats and shallow marine waters. Their abundance and structure may vary across quite small distances.

H2O-078 · Open Harbour

ID: LTAG-RECEIVING-ENVIRONMENT-OPEN-HARBOUR | LTAG

Short description: Open harbour refers to the broader, relatively unobstructed water area within a harbour, away from narrow creeks, sheltered backwaters or small inlets.

Show more: Open-harbour water is commonly influenced by tidal currents, wind-driven waves and exchange with the sea. It may be deeper than surrounding tidal flats, although shallow banks and channels can occur throughout. Salinity, clarity and sediment movement vary with rainfall, river inflows and tidal conditions. The term describes a part of the harbour's spatial setting rather than implying unrestricted access to the open ocean.

H2O-079 · Ocean Discharge

ID: LTAG-RECEIVING-ENVIRONMENT-OCEAN-DISCHARGE | LTAG

Short description: Ocean discharge is water released directly or through a defined outlet into coastal marine water rather than into an inland stream or enclosed drainage system.

Show more: Water reaching the ocean may originate from a pipe, channel, river mouth or other drainage pathway. At the coast, discharge mixes with seawater under the influence of waves, tides and currents. The outlet may be on a beach, among rocks or beneath the water surface. The visible behaviour can range from a small trickle to a strong flow during storms. The term identifies the receiving marine environment and the discharge connection, not the quality of the released water.

Visible Condition / Process

H2O-080 · Mud

ID: TAG-MUD | TAG

Short description: Mud is a soft, wet mixture of fine sediment and water, often containing decomposing plant material.

Show more: Mud commonly forms in places where fine particles settle, including sheltered estuaries, lake margins, ponds and slow-flowing channels. It may be grey, brown or black and can feel sticky or slippery. Animal burrows, plant roots and shell pieces may be present. As mud dries it can harden or crack. Oxygen-poor organic mud sometimes gives off an egg-like sulphur smell when disturbed. Mud is a physical material and its appearance alone does not reveal the full chemical composition.

H2O-081 · Sand

ID: TAG-SAND | TAG

Short description: Sand consists of loose, gritty particles roughly 0.063 to 2 millimetres in diameter, larger than silt and smaller than gravel.

Show more: Sand may come from broken rock, volcanic minerals, shell fragments or other natural sources. It is common on beaches, dunes, channels and riverbanks. Water and wind can move grains into ripples, bars and layers. Sand tends to settle more quickly than fine silt or clay when water becomes still. Grain colour, roundness and size vary by source and transport history. Wet sand can pack together, while dry sand is typically free-flowing.

H2O-082 · Organic

ID: TAG-ORGANIC | TAG

Short description: Organic material consists of remains or products of living organisms, including leaves, roots, wood, algae and decomposing plant or animal matter.

Show more: Organic material enters waterways and soils from surrounding vegetation and aquatic life. It ranges from recognisable twigs and leaves to dark, finely broken-down particles. In wetlands and muddy sediments, decomposition may be slow because little oxygen is available. Organic particles can float, drift, settle or become buried among mineral sediment. They provide food and energy for microorganisms and other organisms. The word organic describes the biological origin of the material, not necessarily its freshness or condition.

H2O-083 · Forestry Slash

ID: TAG-FORESTRY-SLASH | TAG

Short description: Forestry slash is woody material left or moved after tree harvesting, including branches, tops, bark, broken stems and other timber residues.

Show more: Slash may lie scattered across a harvested slope or accumulate in piles, gullies and stream channels. Pieces vary from small twigs to large logs. Some slash decomposes where it falls, while mobile pieces can be carried downhill or downstream during heavy rain and floods. Its appearance and density depend on the trees harvested and the logging method. Slash is distinguishable from ordinary leaf litter by its association with felled timber and larger woody residues.

H2O-084 · Debris

ID: TAG-DEBRIS | TAG

Short description: Debris is a mixture of loose or displaced material such as branches, leaves, litter, stones, fragments of structures or other scattered objects.

Show more: Debris can originate from natural processes, storms, flooding, erosion, land use or human activity. In rivers and drains it may become trapped against banks, culverts, bridges or vegetation. Some material floats while denser fragments settle. A debris accumulation may include both organic matter and manufactured objects. Its exact composition can vary even within one pile. The term describes loose material present at a place rather than identifying one particular source or substance.

H2O-085 · Slip

ID: TAG-SLIP | TAG

Short description: A slip is an area where soil, rock or other earth material has moved downhill under gravity, often leaving a visible scar or displaced mass.

Show more: Slips are also called landslides and can range from shallow surface failures to large movements involving substantial ground. A slip may show exposed soil, a head scarp, broken vegetation and material piled downslope. Rainfall, groundwater, erosion at the base, earthquakes and slope geometry can all influence stability. Some slips move suddenly, while others develop gradually. The exposed material and displaced debris may enter nearby gullies or watercourses.

H2O-086 · Bank Collapse

ID: TAG-BANK-COLLAPSE | TAG

Short description: Bank collapse is the breaking away or falling of part of a stream, river, estuary or channel bank into the water or onto lower ground.

Show more: Collapsed banks may show fresh vertical faces, cracked soil, exposed roots and fallen blocks of earth. The failure can involve a small section or a long reach. It may occur when moving water erodes the base, saturated soil loses strength or the bank is too steep for its material. Fallen material can temporarily lie at the toe before being moved away. Vegetation and hard structures may remain partly attached to a collapsed section.

H2O-087 · Scour

ID: TAG-SCOUR | TAG

Short description: Scour is the removal of soil or sediment from a bed or bank by flowing water, usually in a concentrated area.

Show more: Scour often forms local holes or depressions where water speeds up or becomes turbulent, such as around bridge piers, culvert outlets, bends or bank projections. The depth and shape depend on flow strength, sediment size and the length of the event. Scoured material is carried downstream or redeposited nearby. In a channel, fresh scour may expose roots, larger stones or buried structures. Scour is a form of erosion driven specifically by moving water.

H2O-088 · Stagnant Water

ID: TAG-STAGNANT-WATER | TAG

Short description: Stagnant water is water with very little noticeable movement or exchange, often remaining in a pool, drain or backwater for an extended period.

Show more: Low-flow water may occur where a channel is isolated or an outlet is restricted, or where a hollow has no active through-flow. Still water allows suspended particles to settle and may permit algae or floating films to accumulate. In warm conditions, biological activity can change oxygen levels. A calm-looking surface does not necessarily mean there is no movement beneath it. The term refers to the water's limited circulation rather than a particular contaminant.

H2O-089 · Ponding

ID: TAG-PONDING | TAG

Short description: Ponding is the accumulation of surface water in a low area when it does not drain away as quickly as it arrives.

Show more: Ponded water may collect on flat ground, roads, lawns, wetlands and depressions. It can result from heavy rainfall, saturated ground, high downstream water levels or an obstructed drainage route. Pools vary in depth and may remain for minutes, days or much longer. Their edges often expand and shrink as levels change. Ponding differs from a permanent lake or river because it describes a local accumulation, often associated with a particular water-level condition.

H2O-090 · Algae Bloom

ID: TAG-ALGAE-BLOOM | TAG

Short description: An algae bloom is a noticeable increase in algae or similar microscopic organisms in water, sometimes colouring the surface green, brown or red.

Show more: Blooms develop when organisms grow rapidly under favourable combinations of light, temperature, nutrients and water residence time. They may appear as a coloured cloud in the water, floating scum or surface streaks. Some blooms disperse quickly, while others persist. The organisms involved vary from harmless microscopic algae to cyanobacteria, some of which can produce toxins. Colour and appearance alone cannot reliably identify the species or establish whether a bloom is harmful.

H2O-091 · Surface Sheen

ID: TAG-SURFACE-SHEEN | TAG

Short description: A surface sheen is a thin film on water that reflects light differently from the surrounding surface, sometimes showing rainbow colours or an oily appearance.

Show more: A sheen may be caused by petroleum products, natural oils, organic films, iron-related bacteria or other substances. Wind can spread a film into smooth-looking patches, streaks or iridescent bands. Some natural films break into irregular pieces when disturbed, while certain oils behave differently, but appearance alone is not a definitive test of origin. Sheens are most visible on calm water and can collect along sheltered edges or around floating material.

H2O-092 · Plume

ID: TAG-PLUME | TAG

Short description: A plume is a visible stream or cloud of material spreading through water or air from a source, often differing in colour or clarity from its surroundings.

Show more: In waterways, plumes often contain suspended sediment, fine organic particles or coloured water entering from a drain, river or disturbed bed. A plume can have a narrow leading streak or spread into a wider cloud as currents mix it with surrounding water. Its shape changes with flow, turbulence and water density. Some settle quickly while others persist over long distances. A visible plume shows mixing and dispersion, not necessarily the precise quantity or chemical composition of its material.

H2O-093 · Debris Transport

ID: TAG-DEBRIS-TRANSPORT | TAG

Short description: Debris transport is the movement of branches, logs, leaves, litter or other loose objects by flowing water, floods, waves or surface runoff.

Show more: Floating wood and light material can travel with the surface current, while heavier fragments may slide, roll or lodge along a channel bed. Transport rates vary with water depth, speed and the shape of the objects. Debris often collects at bends, bridge supports, culvert entrances and vegetation. During major flows, material that was previously stationary may be carried a considerable distance. The term identifies movement of discrete debris rather than transport of fine sediment grains.

H2O-094 · Clear Water

ID: TAG-CLEAR-WATER | TAG

Short description: Clear water is water through which light passes readily, with little visible cloudiness from suspended particles.

Show more: Water can appear transparent because it contains relatively little suspended sediment, algae or coloured organic material at that moment. Clarity is influenced by

particle concentration, light, depth, water colour and viewing conditions. Clear water is not necessarily chemically pure or safe to drink, because dissolved substances and microorganisms may be invisible. In streams and estuaries, water can change from clear to cloudy quickly after rain, sediment disturbance or changes in tidal mixing.

Appendix A — retired V4 sediment identifiers

These 10 former searchable entries are no longer separate V5 main TAG choices. Do not delete old photographs or reinterpret previous inspector assessments automatically. Migration maps guide future software compatibility.

Old stable ID	Former title	Suggested V5 link
LTAG-SEDIMENT-SOIL-FINE-SEDIMENT	Fine Sediment	H2O-031-01
LTAG-SEDIMENT-SOIL-ORGANIC-SEDIMENT	Organic Sediment	H2O-031-01
LTAG-SEDIMENT-SOIL-MIXED-SEDIMENT	Mixed Sediment	H2O-031-01
LTAG-SEDIMENT-SOIL-SEDIMENT-LAYER	Sediment Layer	H2O-031-04
LTAG-SEDIMENT-SOIL-SEDIMENT-BANK	Sediment Bank	H2O-031-04
LTAG-SEDIMENT-SOIL-SEDIMENT-PLUME	Sediment Plume	H2O-031-03
LTAG-SEDIMENT-SOIL-SEDIMENT-TRANSPORT	Sediment Transport	H2O-031-03
LTAG-RESTRICTIONS-SEDIMENT-BLOCKAGE	Sediment Blockage	H2O-031-04
TAG-FINE-SEDIMENT	Fine Sediment	H2O-031-01
TAG-SEDIMENT-TRANSPORT	Sediment Transport	H2O-031-03

Appendix B — version governance and limits

Numbered identifiers H2O-001 to H2O-094 reflect V5 catalogue order. The long-form stable IDs remain the permanent record keys. The four specialist sediment subsections are child records of H2O-031, not independent TAGs. The four subsections do not

automatically determine a LUIS value. Sand, mud, clay and other existing overlapping entries remain separate pending a broader master-list review.

Future BNet integration: host the approved structured JSON at a versioned HTTPS URL. The Codex may load the latest catalogue for new selections while preserving a version snapshot or source metadata for historical assessments. This document and JSON are draft outputs, not a deployed Codex revision.