Passive Dewatering scenarios

Scenarios for use with Passive Dewatering Regulatory Position Statement [LIT 16815]

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Is a licence required now that the current exemptions from licence control have been removed under the Water Act 2003?

Background and Principles

This guidance applies to all applications for dewatering operations that do not require the use of pumping equipment for the removal and relocation of groundwater. It is to be used in conjunction with our Regulatory Position Statement – Passive Dewatering - and assist in deciding whether an abstraction licence is required.

The Agency does not intend to licence or otherwise draw into regulation passive dewatering operations. Passive dewatering generally refers to groundwater being directly discharged from the strata to the surface under the influence of gravity, without the need of pumping equipment, following the excavation or manipulation of the subsurface. The term covers dewatering as a result of the source of supply being removed (rather than taking of water from the supply itself) and operations required to maintain the long term integrity of a construction or excavation

A strict interpretation of the legislation could result in small scale low risk scenarios being licensed for little environmental or water resource management benefit. We have therefore developed a Regulatory Position Statement (RPS) covering our regulatory approach to passive dewatering which needs to be read in conjunction with the scenarios detailed below.

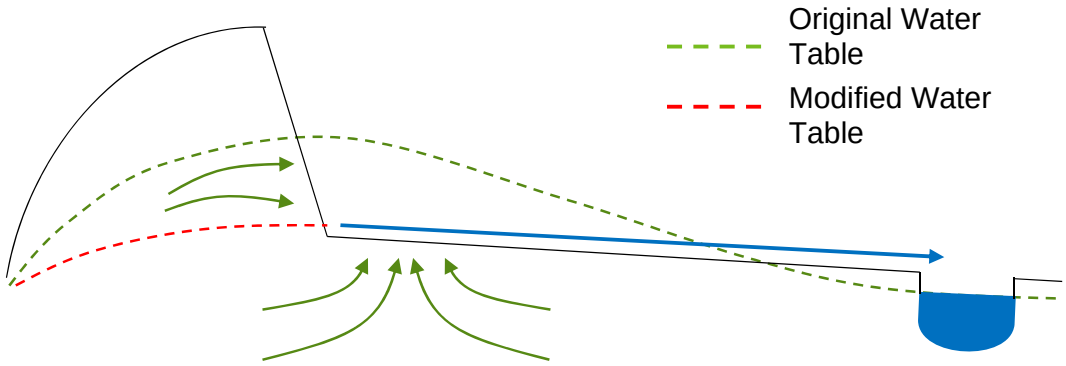
The list of scenarios in this guidance document is not exhaustive, however reflect the general conditions of the Passive Dewatering Regulatory Position Statement in a variety of circumstances.

1. Quarries

Passive Dewatering commonly occurs in hillside quarries as a result of the 'source of supply' being removed (rather than the taking of water from the supply itself).

Any quarrying activity involving the active dewatering of a site via pumping will necessitate a licence to abstract water as any other abstraction would.

Example 1a: Quarry – Groundwater seeping from quarry face/floor channelled to unlined reservoir/inland water.

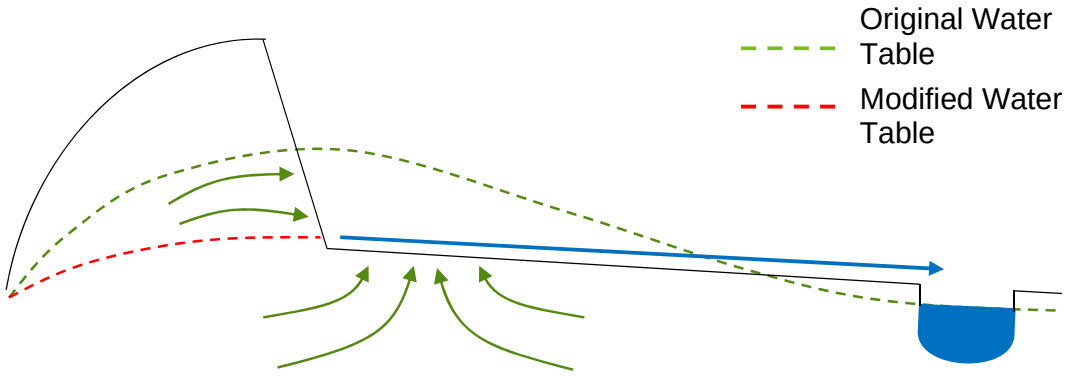


Water discharges directly from strata (quarry floor or face) to the surface without active pumping equipment required to remove groundwater. Water runs/is channelled via gravity to an online watercourse, soakaway, unlined reservoir, or inland water in continuity with the groundwater. There is no future/secondary use of the discharged groundwater.

Passive Dewatering: Yes

Water abstraction licence required: No

Example 1b: Quarry – Groundwater seeping from quarry face/floor channelled to storage reservoir for future/subsequent use.

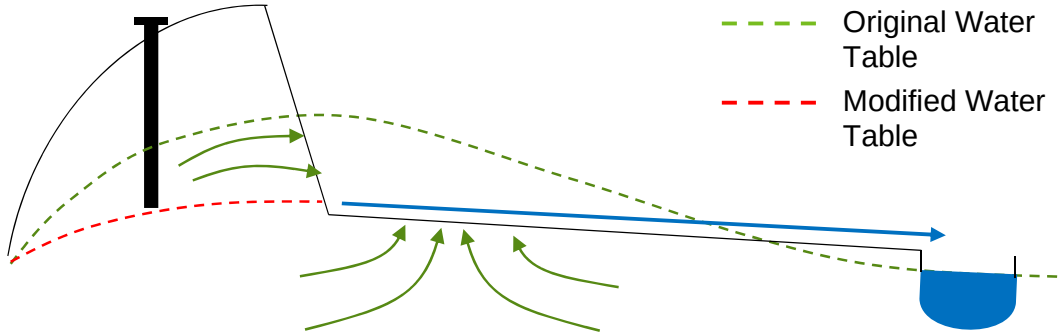


Water discharges directly from strata (quarry floor or face) to the surface without active pumping equipment required to remove groundwater. Water runs/is channelled via gravity to a reservoir (lined or unlined) and is used for a subsequent purpose (e.g. mineral washing).

Passive Dewatering: Yes

Water abstraction licence required: Yes – full licence.

Example 1c: Quarry - Potential for loss or damage to any spring, well or borehole used to supply water for any existing lawful use



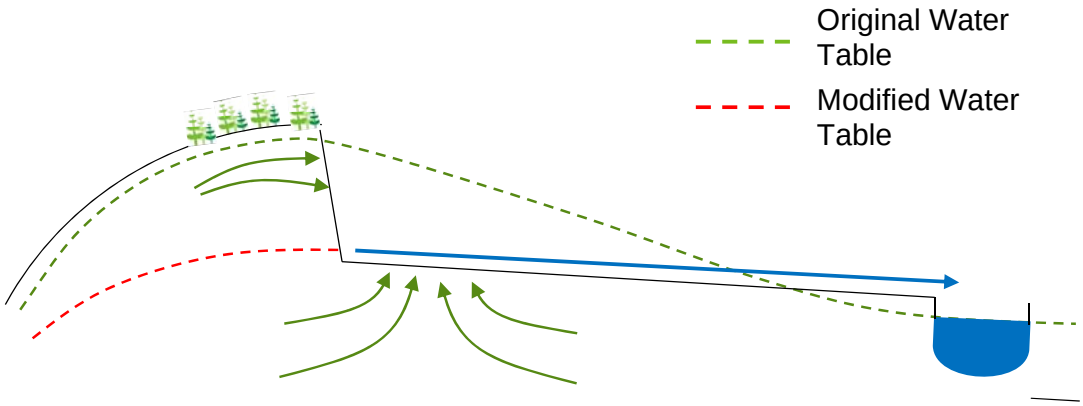
Lawful User (not associated with quarry workings) abstracts groundwater from borehole. Quarry excavation causes water to discharge directly from strata (quarry floor or face) to surface without active pumping equipment required to remove groundwater. Water runs/is channelled via gravity to an inland water, soakaway or unlined reservoir.

There is no future/secondary use of the discharged groundwater. Water table is lowered and derogation of the lawful user abstraction occurs.

Passive Dewatering: Yes

Water abstraction licence required: Potentially – operator should complete Hydrogeological Impact Assessment and seek advice from the Environment Agency if necessary.

Example 1d: Hillside Quarry - Potential for damage to a conservation site or specific features in or on such a site, or damage to protected species



Protected site/species near to quarry workings. Quarry excavation causes water to discharge directly from strata (quarry floor or face) to surface without active pumping equipment required to remove groundwater. Water runs/is channelled via gravity to an inland water, soakaway or unlined reservoir. There is no future/secondary use of the discharged groundwater. Water table is lowered causing damage to the protected site/species.

Passive Dewatering: Yes

Water abstraction licence required: Potentially – operator should complete Hydrogeological Impact Assessment and seek advice from the Environment Agency if necessary.

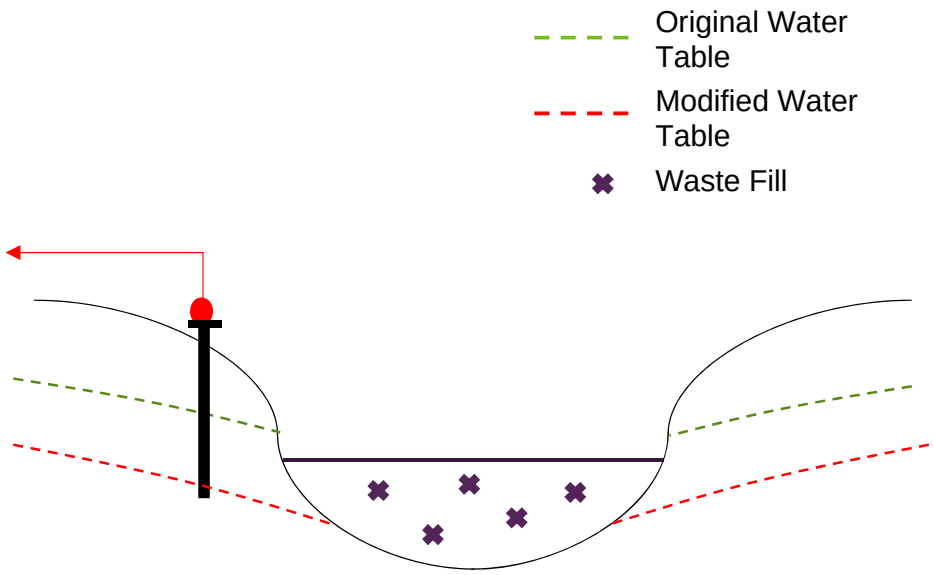
2. Landfills

The modern standard is to limit the presence of landfill where there is possible interaction with groundwater. However, dewatering is still common, especially in areas with shallow drift deposits and where barriers are constructed in deeper landfill sites. The extent of dewatering varies; pumping of groundwater from discrete highly permeable layers to rings of dewatering wells surrounding the excavation to passive back-wall drainage.

Back wall dewatering commonly occurs prior to the complete fill of each cell in order to reduce/remove the risk of liner blow-outs from groundwater pressure. This may be done actively using pumping equipment (this will necessitate a licence as any other abstraction would) or passively, via drainage channels, with water transferred away from the site. Once the landfill is (at least partially) full, the weight of the waste stabilises the liner and the groundwater is allowed to rebound around the site, whilst the waste remains in hydraulic containment. Although dewatering at landfills is usually temporary, groundwater levels at the site may be artificially managed for a significant number of years via dewatering.

Often, planning permission will have been given for future waste cells and which will require associated dewatering. In this case, licences may need to be granted which do not contradict planning conditions.

Example 2a: Valley/Excavation Fill – Active Pumping to remove groundwater outside of landfill liner



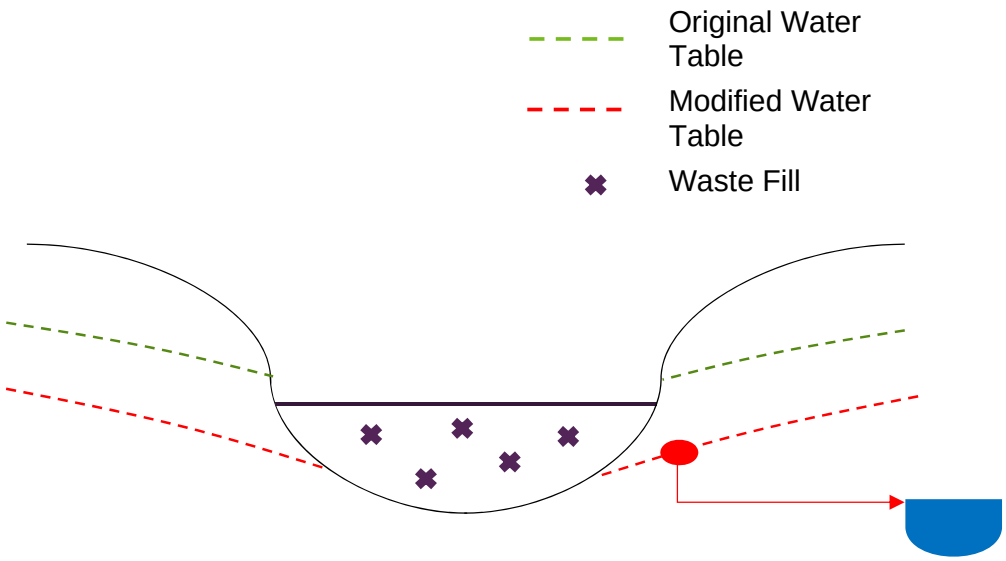
Active dewatering of the groundwater outside the landfill liner using a borehole and pumping equipment is used to prevent back-wall blow-out prior to complete waste fill. This may alter the groundwater levels for numerous years, until abstraction ceases as the weight of the waste is sufficient to stabilise the liner.

There may also be sites in which basal heave is perceived to be a problem. If this is the case, either weight is added to the base of the landfill, or there will be a drain dug under the liner, with a side riser to allow water to be pumped away. As pumping equipment is required in this scenario, this is classed as active dewatering.

Passive Dewatering: No

Water abstraction licence required: Yes – transfer (to alternative source of supply/storage etc.) or full (subsequent use).

Example 2b: Valley/Excavation Fill – Drainage channel outside of liner to remove groundwater, discharging to an online source/unlined or seepage reservoir

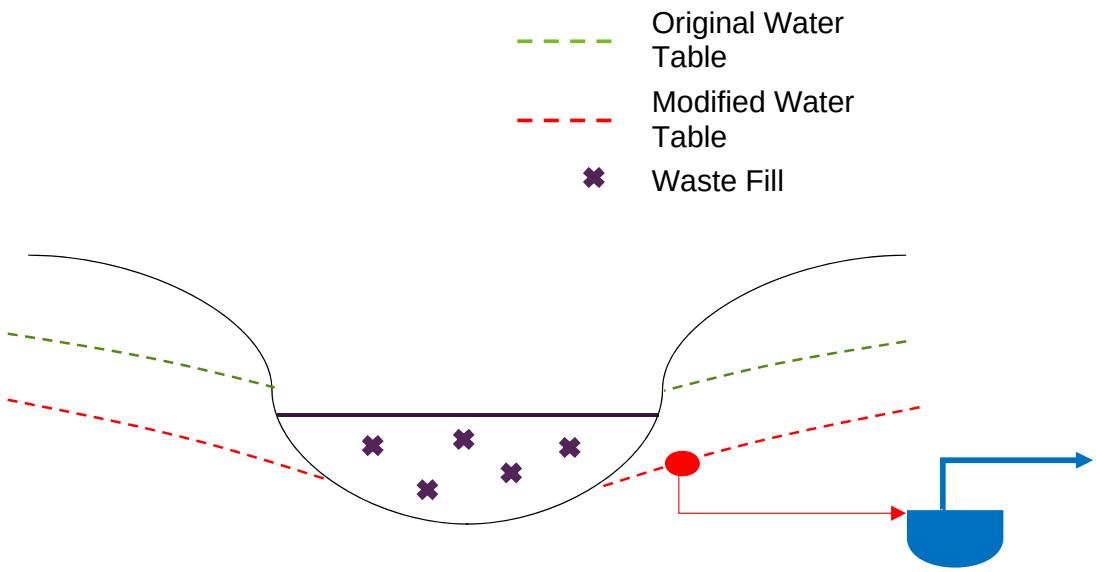


Groundwater is channelled through a conduit/drain (or similar) via gravity outside of the landfill liner to an inland water/unlined reservoir.

Passive Dewatering: Yes

Water abstraction licence required: No

Example 2c: Valley/Excavation Fill – Drainage channel outside of liner to remove groundwater, discharging to a reservoir/storage for future/subsequent use.

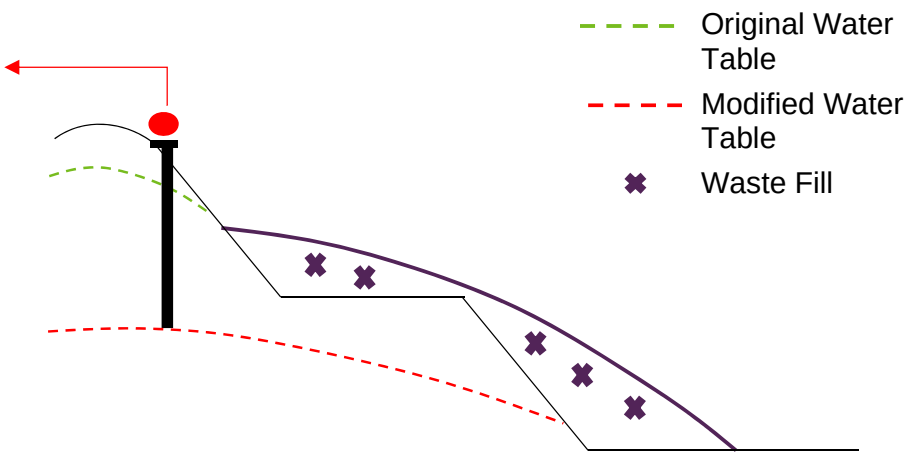


Groundwater is channelled through a conduit/drain (or similar) via gravity outside of the landfill liner to a reservoir/storage lagoon for future/secondary use.

Passive Dewatering: Yes

Water abstraction licence required: Yes – full licence.

Example 2d: Hillside Fill - Active Pumping to remove groundwater outside of landfill liner

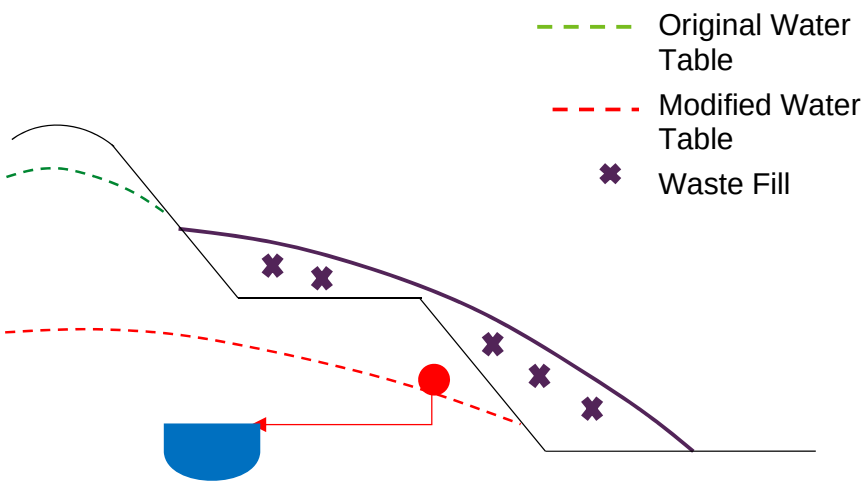


Active dewatering of the groundwater outside the landfill liner using a borehole and pumping equipment is used to prevent back-wall blow-out prior to complete waste fill. This may alter the groundwater levels for numerous years, until abstraction ceases as the weight of the waste is sufficient to stabilise the liner.

Passive Dewatering: No

Water Abstraction licence required: Yes – Full or Transfer

Example 2e: Hillside Fill - Drainage channel outside of liner to remove groundwater, discharging to an online source/unlined or seepage reservoir

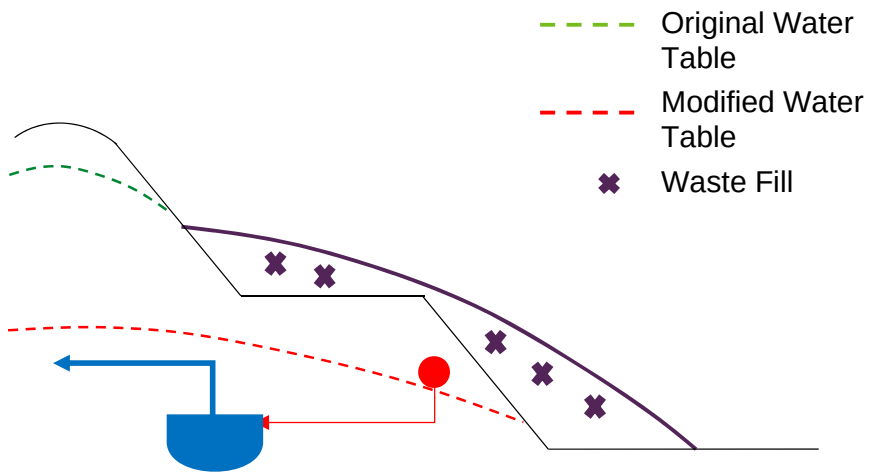


Groundwater is channelled through a conduit/drain (or similar) via gravity outside of the landfill liner to an inland water/unlined reservoir.

Passive Dewatering: No

Water abstraction licence required: No

Example 2f: Hillside Fill - Drainage channel outside of liner to remove groundwater, discharging to a reservoir/storage for future/subsequent use.



Groundwater is channelled through a conduit/drain (or similar) via gravity outside of the landfill liner to a reservoir/storage lagoon for future/secondary use.

Passive Dewatering: No

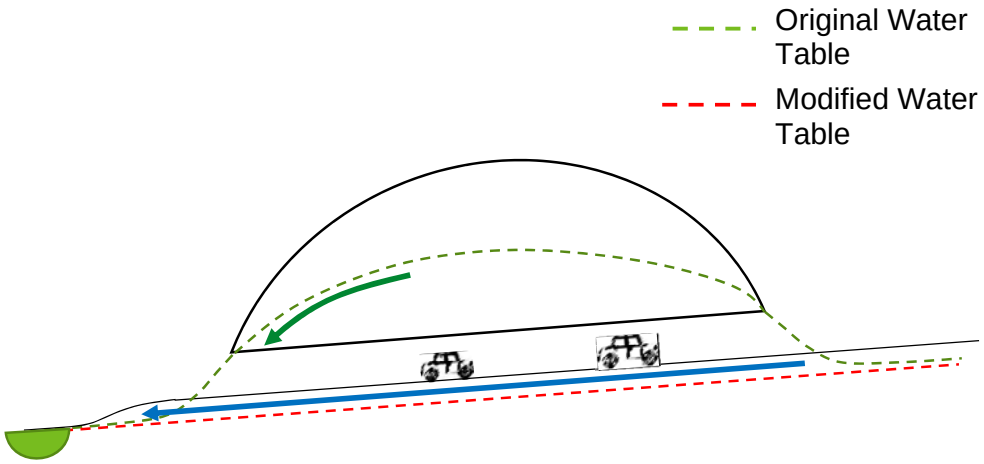
Water abstraction licence required: Yes – Full or Transfer

As with previous quarry examples, licences may be required if the conditions of the RPS are not met regarding loss or damage to lawful users, or damage to protected areas or species.

3. Railways and Roads

Passive dewatering arrangements commonly occur post construction and are required to maintain future integrity and resilience of the built/excavated structure. This is often the case for road and railway tunnels and cuttings constructed below the water table. In these situations there may be permanent groundwater displacement, which will be maintained for the lifetime of the structure. This can be significant and may have far-reaching effects. In certain cases, substantial infrastructure may be installed to aid the drainage of groundwater in order to maintain the integrity of the construction.

Example 3a: Tunnel through Hill (Road/Railway etc.)

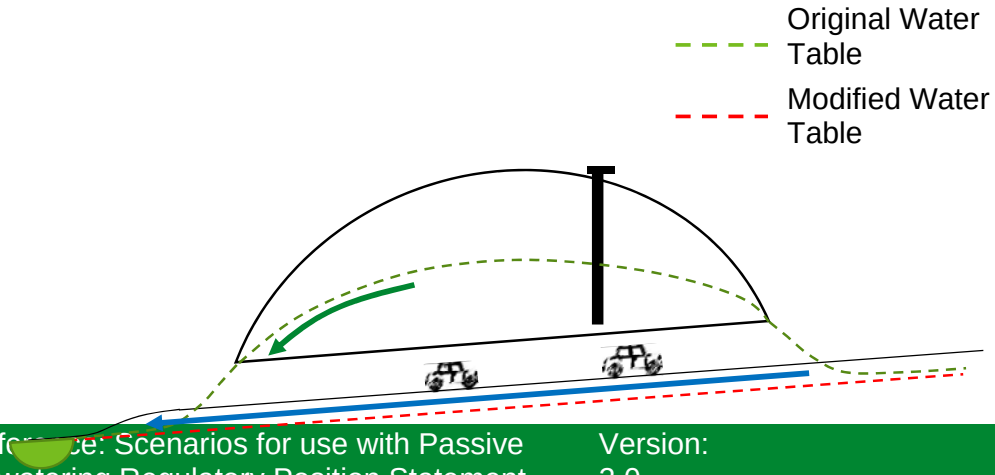


Removal of the source of supply causes water to discharge directly from strata to surface without active pumping equipment required to remove groundwater. Water runs/is channelled via gravity to an online watercourse, soakaway, unlined reservoir, or inland water in continuity with the groundwater. There is no future/secondary use of the discharged groundwater.

Passive Dewatering: Yes

Water abstraction licence required: No

Example 3b: Tunnel through Hill - Potential for loss or damage to any spring, well or borehole used to supply water for any existing lawful use



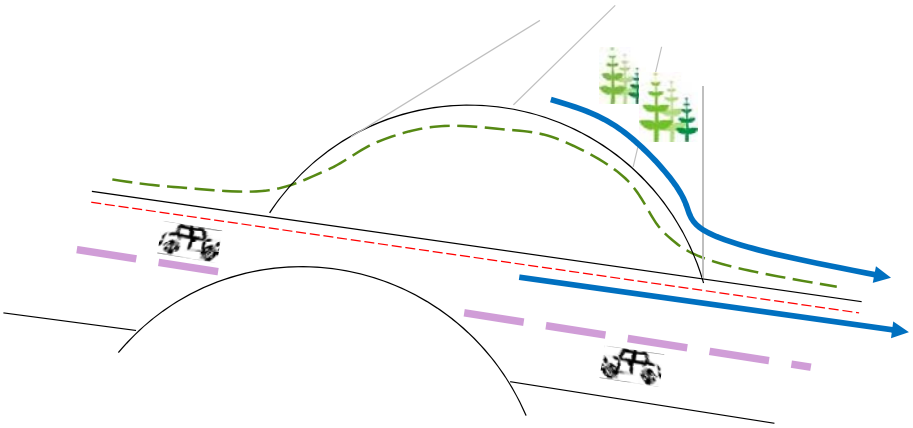
Lawful User (not associated with tunnel construction) abstracts groundwater from borehole. Removal of the source of supply causes water to discharge directly from strata to surface without active pumping equipment required to remove groundwater. Water runs/is channelled via gravity to an online watercourse, soakaway, unlined reservoir, or inland water in continuity with the groundwater. There is no future/secondary use of the discharged groundwater.

Water table is lowered and derogation of the lawful user abstraction occurs.

Passive Dewatering: Yes

Water abstraction licence required: Potentially – operator should complete Hydrogeological Impact Assessment and seek advice from the Environment Agency if necessary.

Example 3d: Road Cut through Hill - Potential for damage to a conservation site or specific features in or on such a site, or damage to protected species



Protected site/species near to road construction. Removal of the source of supply causes water to discharge directly from strata to surface without active pumping equipment required to remove groundwater. Water runs/is channelled via gravity to an online watercourse, soakaway, unlined reservoir, or inland water in continuity with the groundwater. There is no future/secondary use of the discharged groundwater. Water table is lowered causing damage to the protected site/species.

Passive Dewatering: Yes

Water abstraction licence required: Potentially – operator should complete Hydrogeological Impact Assessment and seek advice from the Environment Agency if necessary.

Definitions: section 221 Water Resources Act 1991

"**abstraction**", in relation to water contained in any source of supply, means the doing of anything whereby any of that water is removed from that source of supply, whether temporarily or permanently, including anything whereby the water is so removed for the purpose of being transferred to another source of supply; and "abstract" shall be construed accordingly;

"**inland waters**" means the whole or any part of—

(a) any river, stream or other watercourse (within the meaning of Chapter II of Part II of this Act), whether natural or artificial and whether tidal or not;

(b) any lake or pond, whether natural or artificial, or any reservoir or dock, in so far as the lake, pond, reservoir or dock does not fall within paragraph (a) of this definition; and

(c) so much of any channel, creek, bay, estuary or arm of the sea as does not fall within paragraph (a) or (b) of this definition;

"**underground strata**" means strata subjacent to the surface of any land;