

Ground Water Monitoring Well Specifications & Construction

NC Division of Water Quality
Groundwater Section
Permits & Compliance Unit

Introduction



- Well Construction Regulations
- Constructing a Monitoring Well
- Building a Monitoring Well
- Well Abandonment

Well Construction Regulations

- Title 15A NCAC 2C
 - Well Construction Standards
- Title 15A NCAC 2C .0108
 - MW, RW & Injection Well Const. Stds.



Well Construction Regulations

- Key Points/ Things to Watch for:
 - Local Jurisdictions may have stricter rules
 - No connecting of separate aquifers
 - Temporary wells must be made permanent or abandoned w/in 5 days of construction
 - All wells require a permit



Constructing a Monitoring Well

- Who Can Construct a Monitoring Well?
(NC General Statute 87-98.4 (b))
 - A State-Certified Well Drilling Contractor
 - Property Owner
 - Property Tenant

NOTE: The Permittee or Responsible Party should be on-site during construction to ensure proper location of wells.

Constructing a Monitoring Well

- What Construction Materials should be used?
 - Well Casing and Screens must be chemically compatible with the substances being monitored!
 - GW samples can be contaminated.
 - Well casing and screen can weaken and become unusable.

Note: PVC Casing is incompatible with Acetone. Do not use glue for joints!!!!

Constructing a Monitoring Well

- How Deep should the well be?
 - Well Screen top must be above the water table at all times.
 - Well Screen bottom must remain submerged at all times.

The Well Screen must extend above the mean seasonal high water table and below the mean seasonal low water table.

NOTE: Dense contaminants (“sinkers”) may require deeper screens.



Building a Monitoring Well



Land Surface



Mean Seasonal High Water Table

Mean Seasonal Low Water Table

Building a Monitoring Well



Land Surface

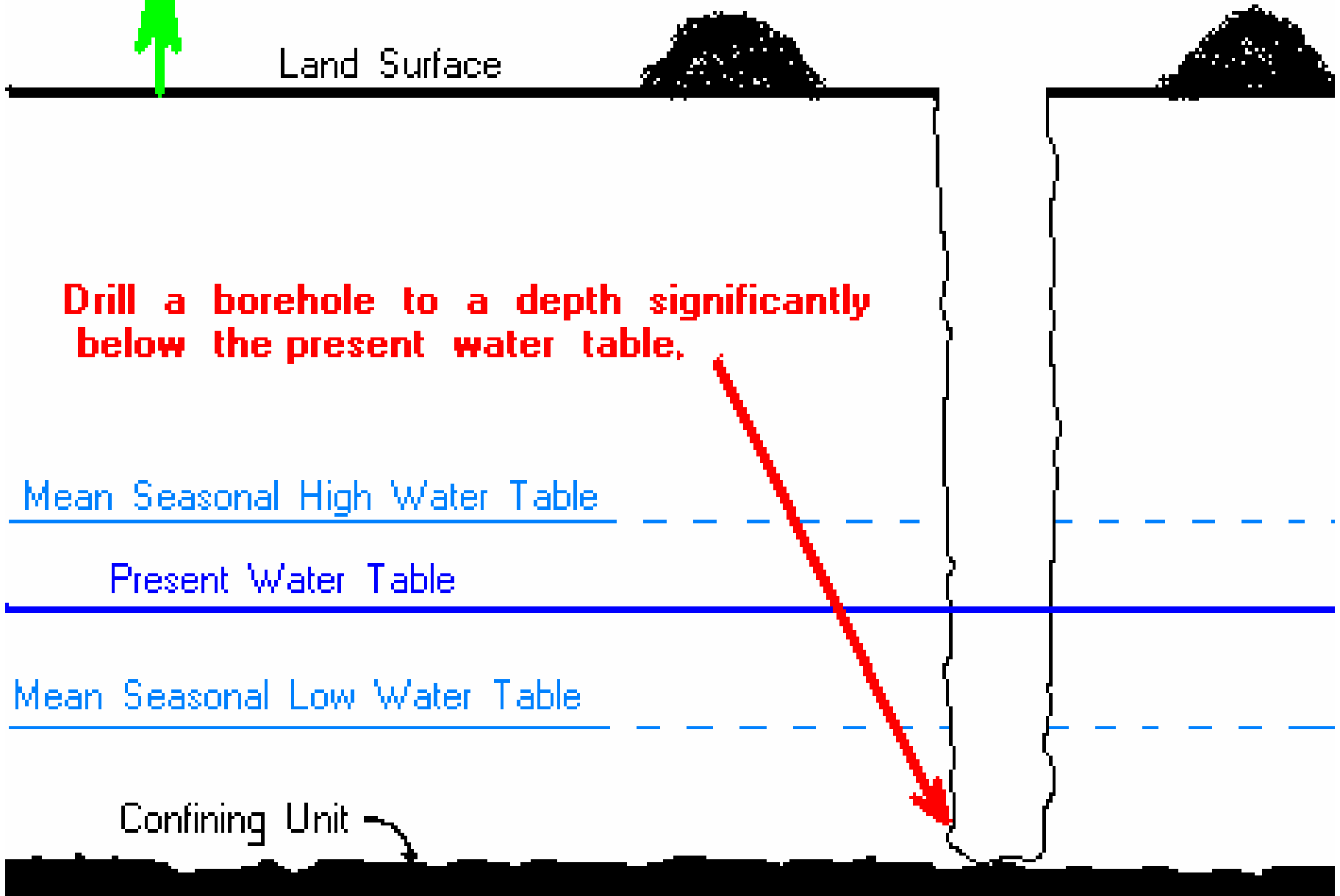
Drill a borehole to a depth significantly below the present water table.

Mean Seasonal High Water Table

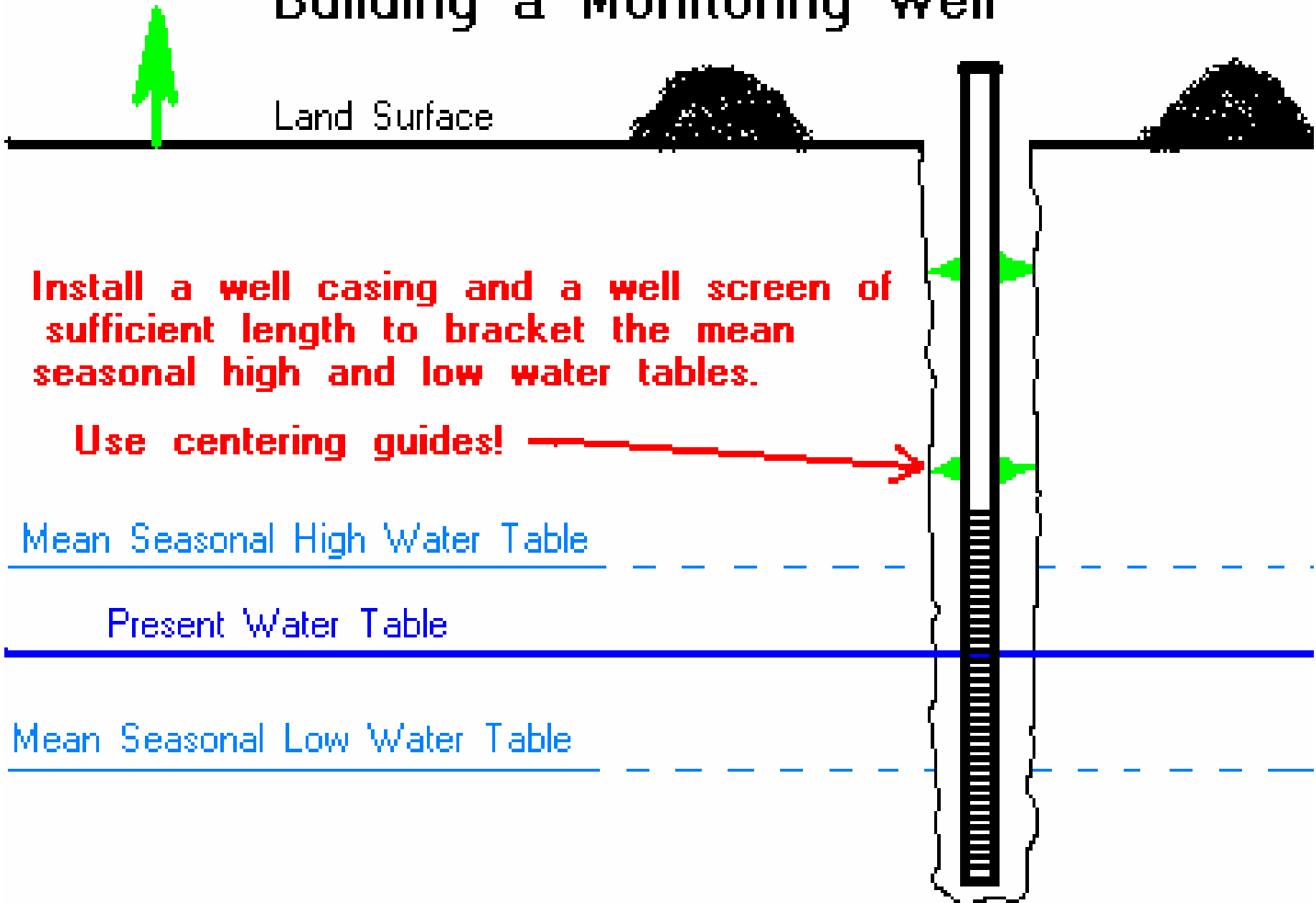
Present Water Table

Mean Seasonal Low Water Table

Confining Unit



Building a Monitoring Well



Install a well casing and a well screen of sufficient length to bracket the mean seasonal high and low water tables.

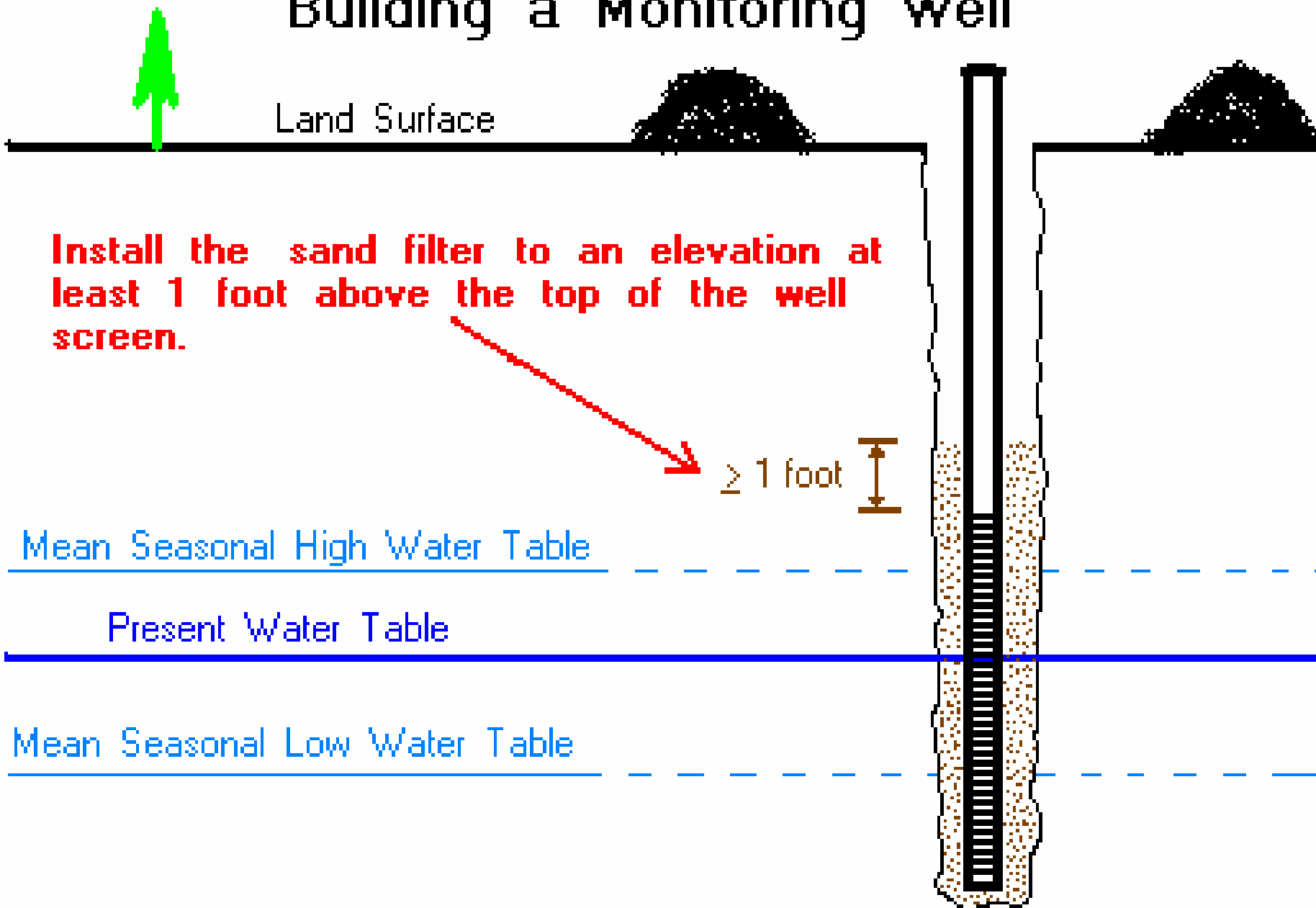
Use centering guides!

Mean Seasonal High Water Table

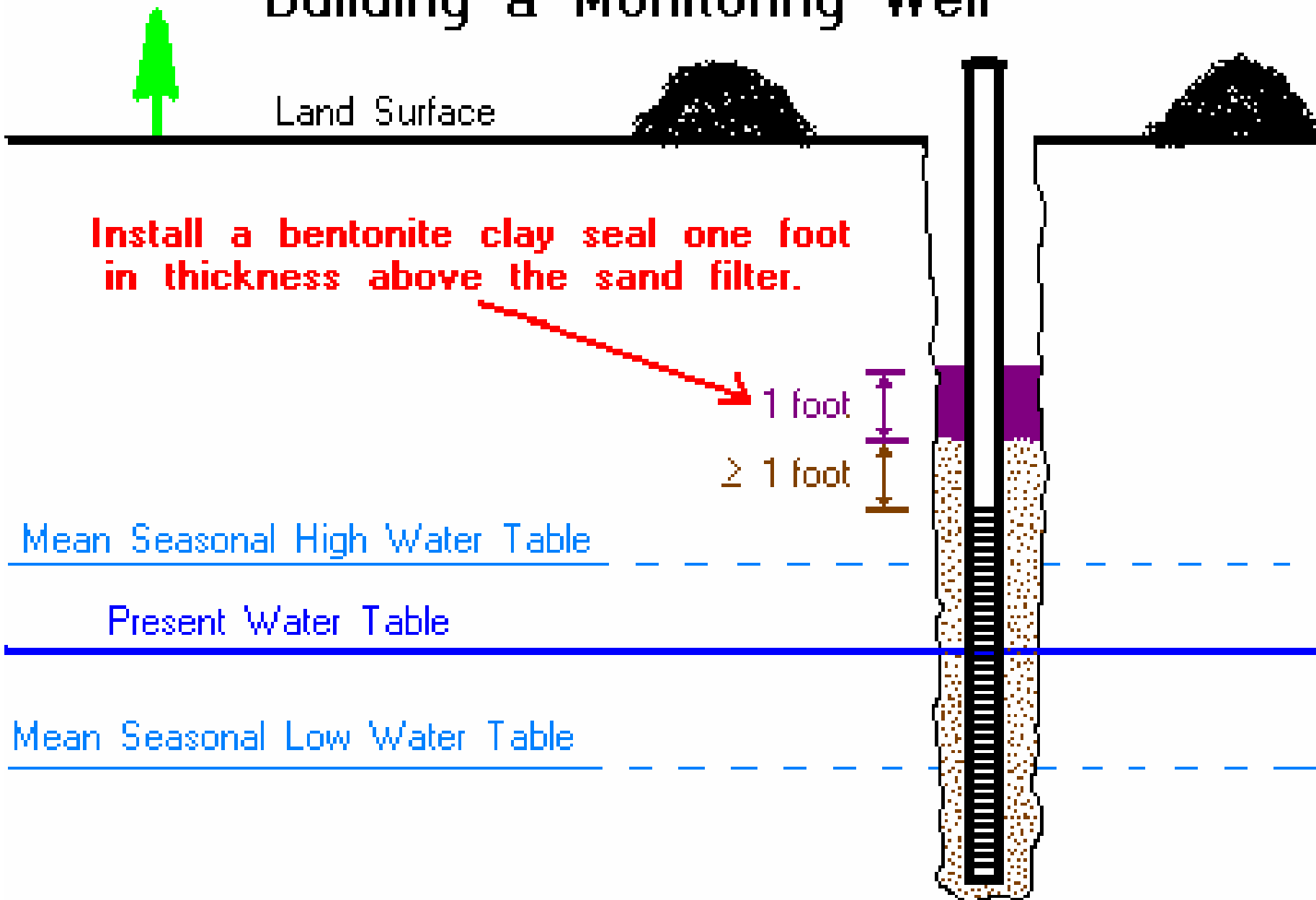
Present Water Table

Mean Seasonal Low Water Table

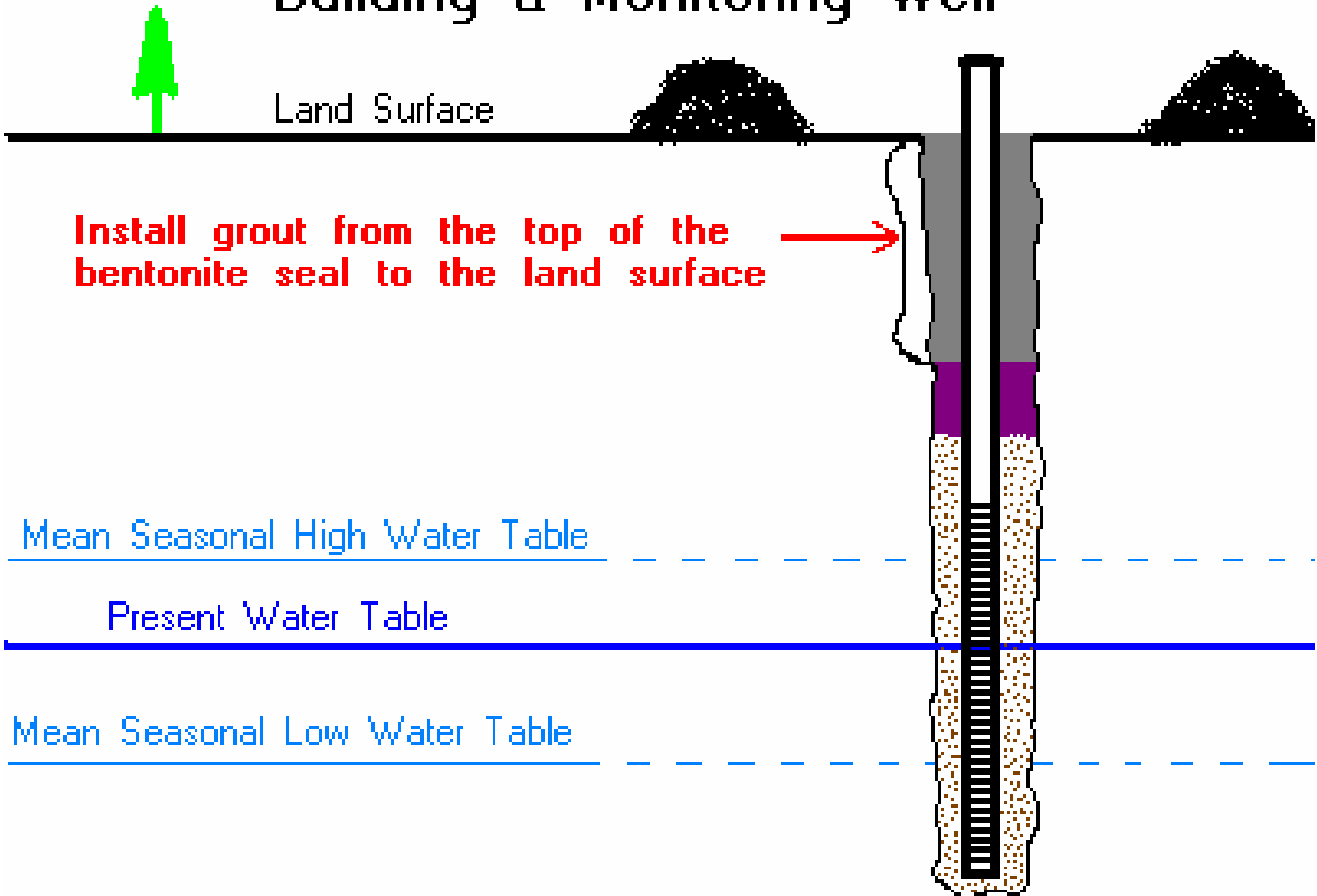
Building a Monitoring Well



Building a Monitoring Well



Building a Monitoring Well



Building a Monitoring Well



Land Surface

1 foot

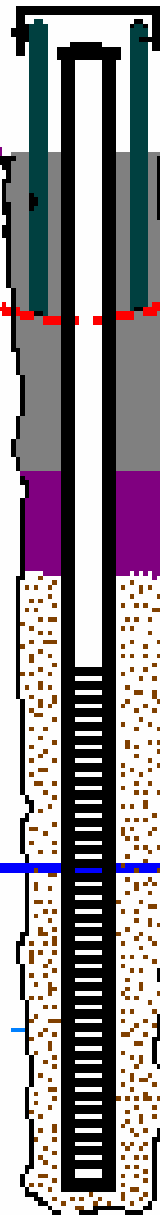
Before the grout hardens:

- Install a protective casing and a locking cap to restrict access.
- The protective casing should extend at least one foot above land surface.

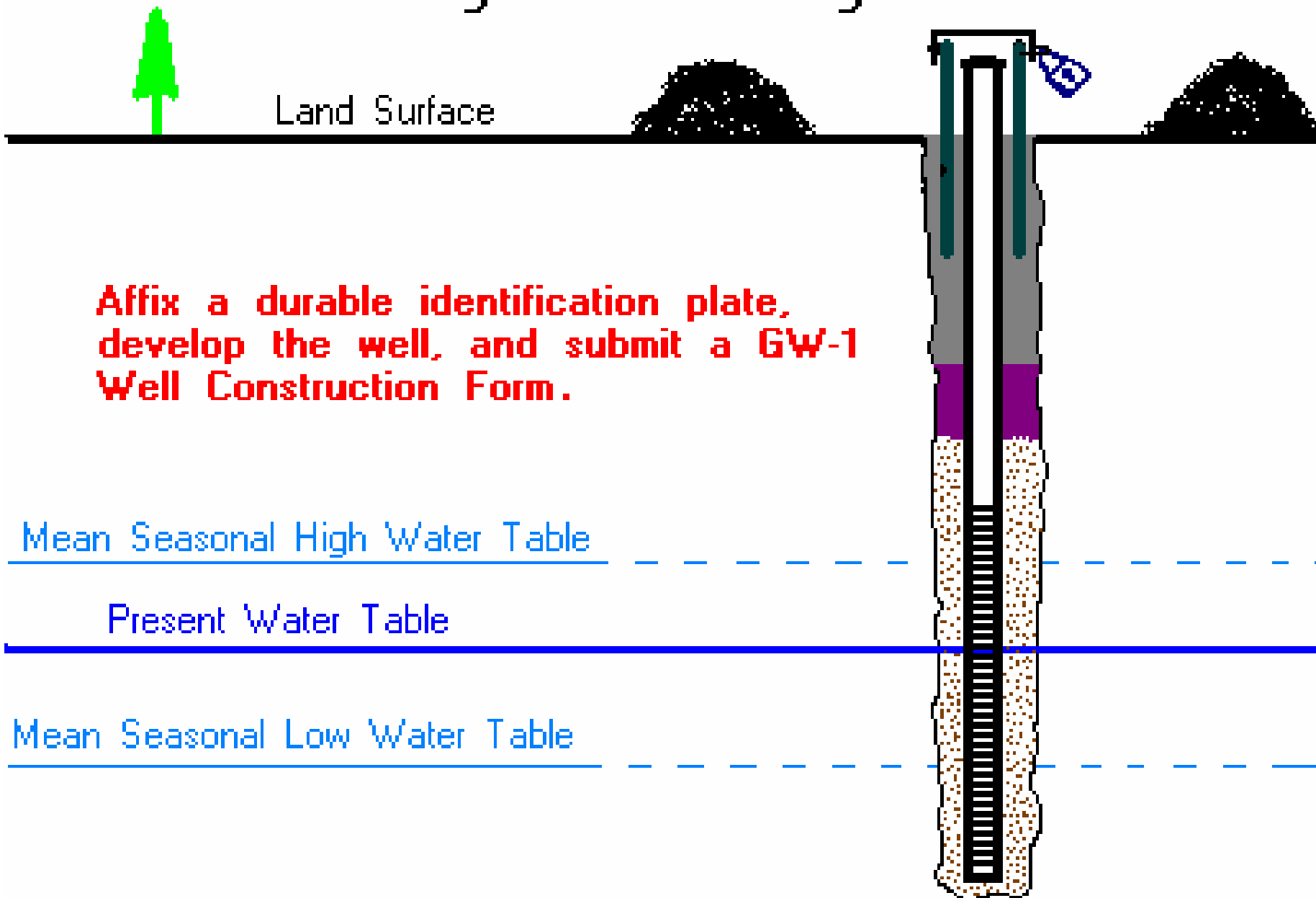
Mean Seasonal High Water Table

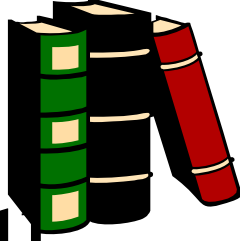
Present Water Table

Mean Seasonal Low Water Table



Building a Monitoring Well





Constructing a Monitoring Well

- When should a well be repaired or replaced?
 - When the Protective Casing is bent, severely damaged, or severely rusted.
 - When the well cap is compromised or cannot be secured.
 - When the cement around the Protective Casing is severely cracked.
 - When a well screen is set improperly (i.e., too shallow or too deep).

Permanent Well Abandonment

- Regulations: 15A NCAC 2C .0113
 - Ensure the well is properly grouted
 - If not, remove well casing or over-ream and re-grout the annulus.
 - Sound the well to verify absence of obstructions.
 - Disinfect the well using HTH

NOTE: Do not use liquid bleach!

Permanent Well Abandonment (Continued)

- Regulations: 15A NCAC 2C .0113

- If MW is:

- < 20 ft. deep

- Doesn't reach the water table

Then fill the well entirely with grout, dry clay, bentonite grout or drill cuttings.

- If MW penetrates the water table, fill the well entirely with grout (cement or bentonite).

Summary



- Well Construction Regulations
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Any Questions?

Groundwater Section



Permits & Compliance Unit

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