

The Water FLUTE Method

presented by

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Presentation will cover the following:

- Characteristics of the *Water FLUTE* method
- How an installation is done
- The sampling system geometry
- The sampling procedure
- Where *Water FLUTE* is being used
- Advantages of *Water FLUTE*
- Issues Addressed in the Design
- Price
- Where to get it, and who can install it.

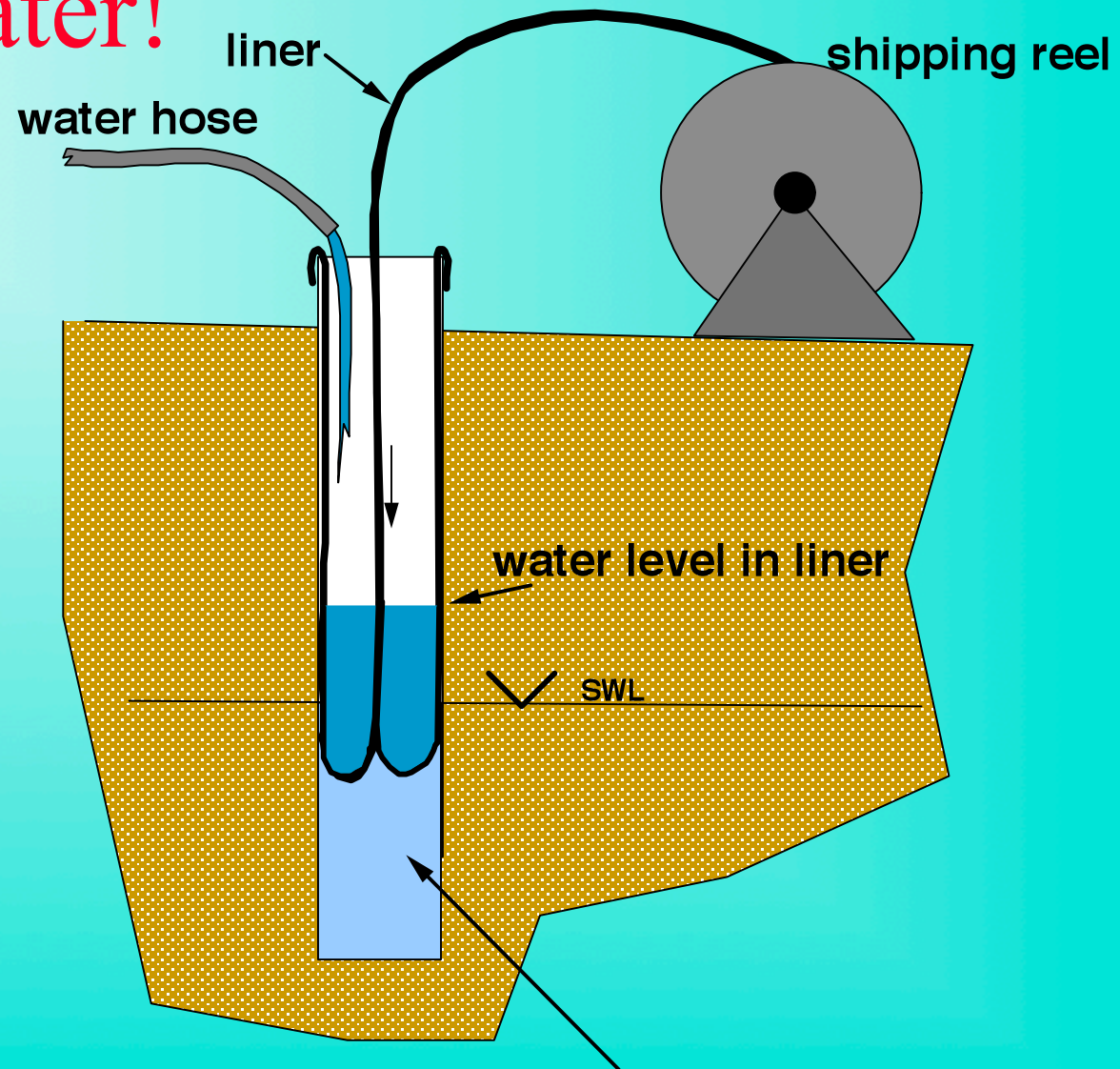
The *Water FLUTE* method:

- Very compact. (often air freight)
- Easy to install (some liners as quick as 15 min. from setup, Milford, NH)
- Seals the entire hole against flow
- Draws the sample directly from the formation
- Produces very small purge volumes
- Easy to purge & sample (30 min./5 ports)
- Allows individual head measurements for each port
- Allows many ports in one hole (1 to 30+)
- Is easily removed

How an installation is done

- Set the liner reel on an axle, next to the hole.
- If necessary, lower a purge tube into the hole for removal of water
- Clamp the in-side-out end of liner over casing
- Push 3 ft. of liner into casing
- Add water to liner as it descends.
- When liner reaches bottom of hole, attach wellhead fittings to tubing
- Purge sample tubing, and collect the samples

Just add water!



Original water in hole is displaced or, it can be removed by pumping during the installation

Installations usually require a worker (and some observers/trainees)



4 ports, 150 ft.
Valley Forge, PA

“This is not
that hard.”

Water FLUTE

Cambridge, Ont.

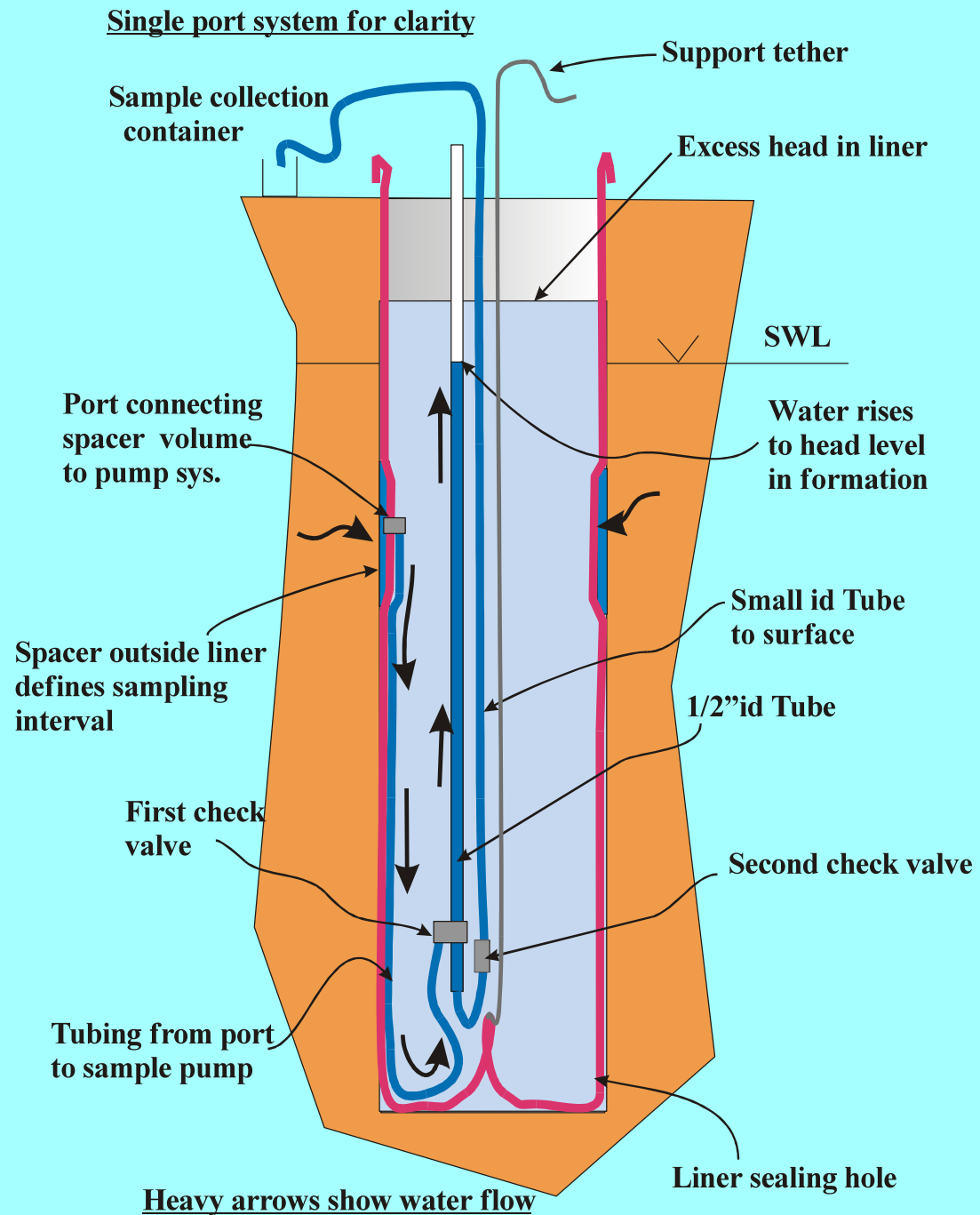
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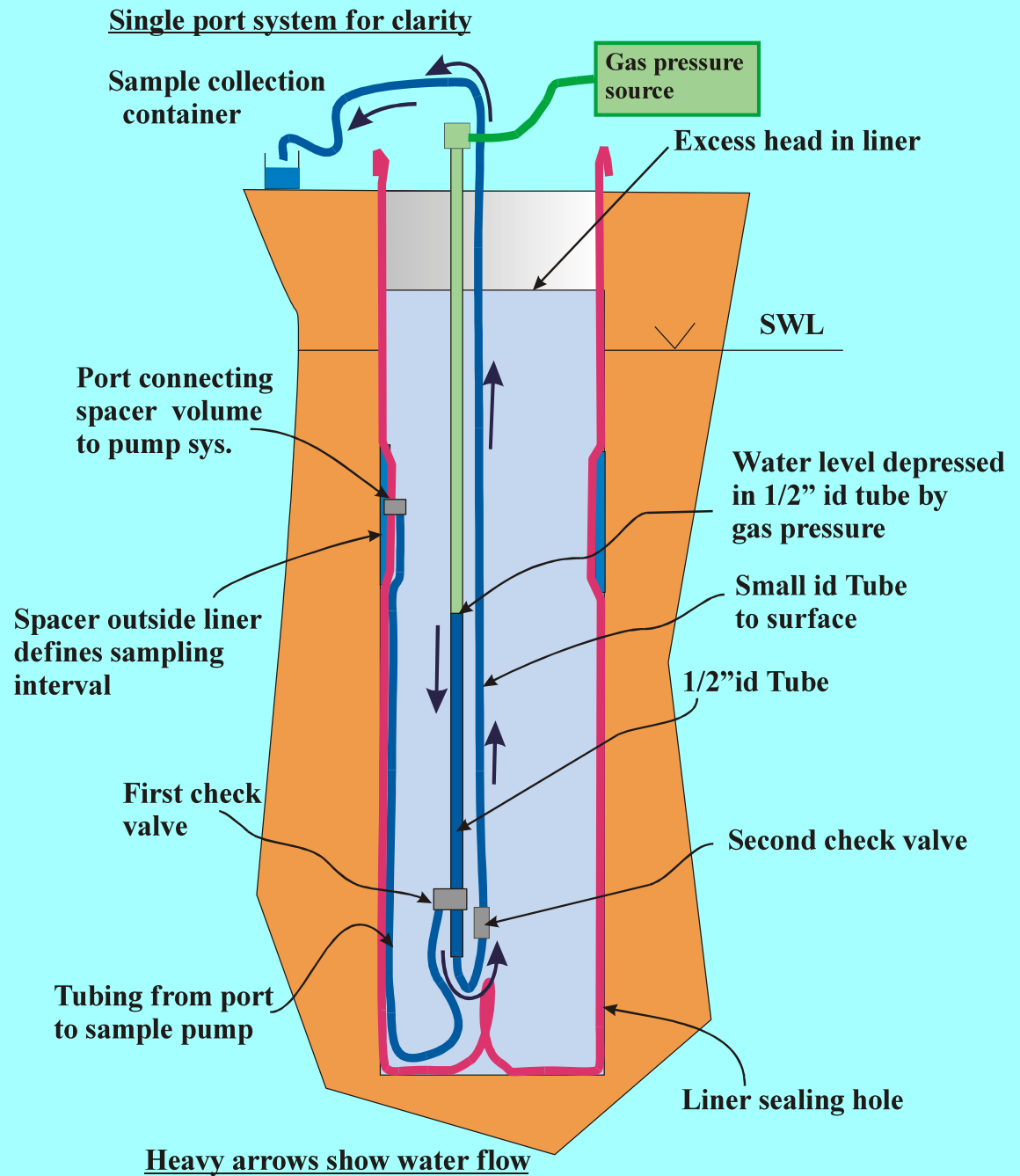
15 ports to 330ft.



The in-situ geometry of the sampling system



The pump is simple, reliable and high volume



The sampling procedure

- Water fills the U shaped tube when installed
- Tag the water level in the large tube
- Attach an air/gas source to the large tube fitting
- Drive the water down the large tube and up the slender tube
- Allow the large tube to refill, purge it again
- Allow the large tube to refill, drive the sample to the surface at a lower pressure.
- Discard the first tube volume, collect the sample.
- All ports can be purged and sampled simultaneously

15 ports and 15 press. transducers



The unique characteristics are:

- **Seals the entire hole against flow**
- **Easy to install (typically, 1-8 hr.)**
- **Draws each sample directly from the formation**
- **Is easily removed**
- **Produces a large sample volume per port**
- **Pressure tested fully assembled in the factory
(to 300 psi)**

The other attractive characteristics

- **Allows many ports in one hole (1 - 30+)**
- **Allows a head measurement for each port**
- **Easy to purge and sample (e.g., 30 min./5 ports)**
- **Relatively inexpensive**
- **Very Compact. (often shipped air freight)**

FLUTE systems have been used in the following 45 States:

New York, Maine, Pennsylvania, Ohio, Rhode Is., Massachusetts, Delaware, Connecticut, New Hampshire, California, Texas, Arizona, New Mexico, Wisconsin, Idaho, Nebraska, Missouri, Indiana, Kentucky, Florida, Maryland, Utah, Montana, New Jersey, Washington, Michigan, Tennessee, North Carolina, South Carolina, Iowa, Kansas, Nevada, Minnesota, Oklahoma, Georgia, Rhode Island, West Virginia and Alabama. Plus, Washington D. C., Ontario, Canada, France, Great Britain, Japan, Spain, and Denmark.

Water FLUTE systems have been used in 21 of these “states”.

NAPL FLUTE systems have been used in 27 of these “states”.

Blank Liners have been used in all 45 states.

Issues addressed in the design

- seal quality of liner in the hole
- seal quality of the liner against leakage from the liner
- sample quality as affected by the sampling geometry and the components of the system
- ease of installation and of sampling
- durability of components
- compatibility with the various drilling methods
- ability to clean the hole of drilling fluids

The *FLUTE* systems are available
from:

Flexible Liner Underground Technologies,
6 Easy St., Santa Fe, NM 87501
Phone: 888-333-2433
and, email: info@flut.com

Delivery times are 2-4 wks for most systems. Earlier deliveries are possible.

Installations can be done by *FLUTE* or by those trained by *FLUTE* on site

Most customers prefer *FLUTE* to install the liners. The small amount of installation equipment sometimes needed is sold or rented by *FLUTE* (e.g., water pumps, bubbler level sensors, rollers and winches for removal (if needed for deep or large diameter systems.)

Thanks for your consideration of
our methods

see our web site at: **flut.com**
for other *FLUTE* technologies