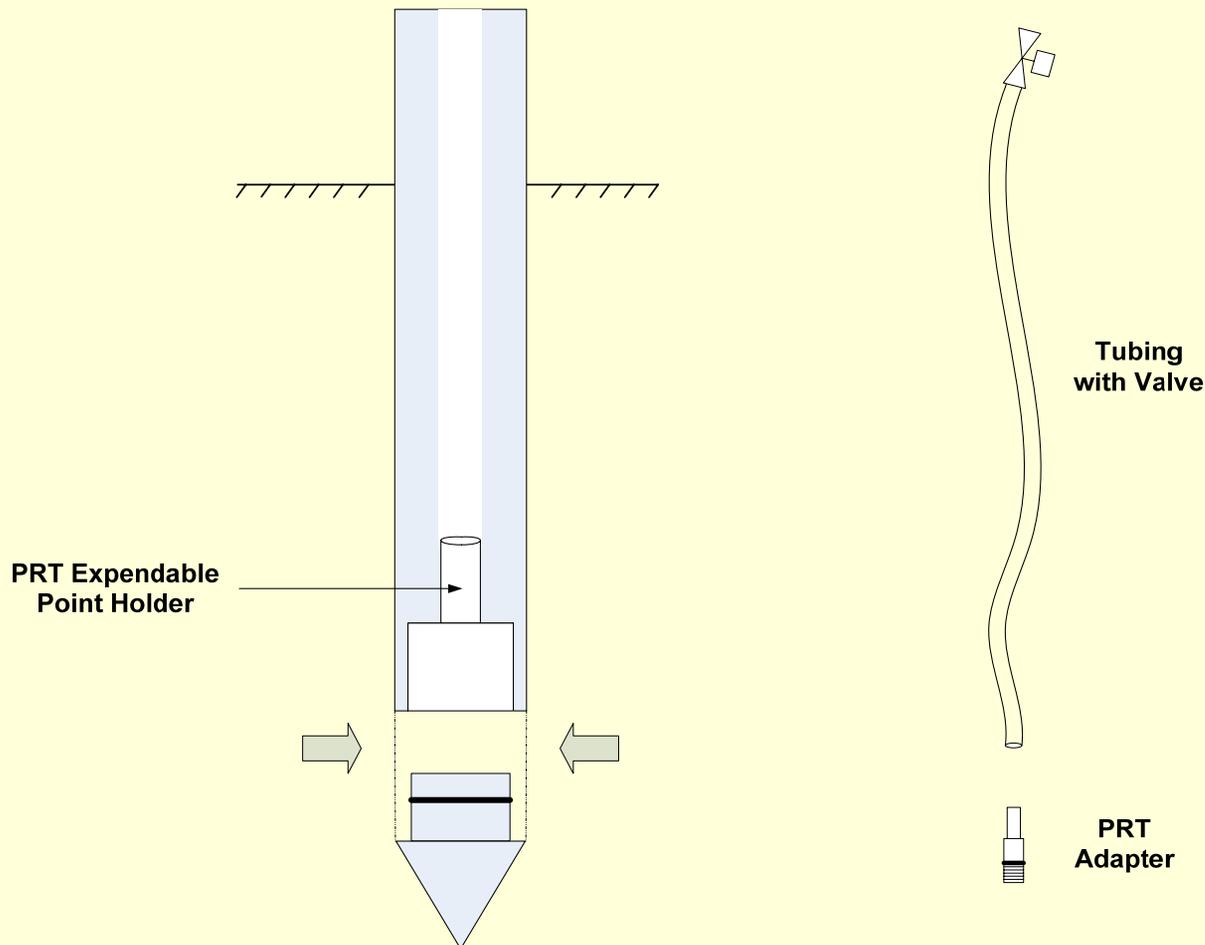


# Topics of Discussion

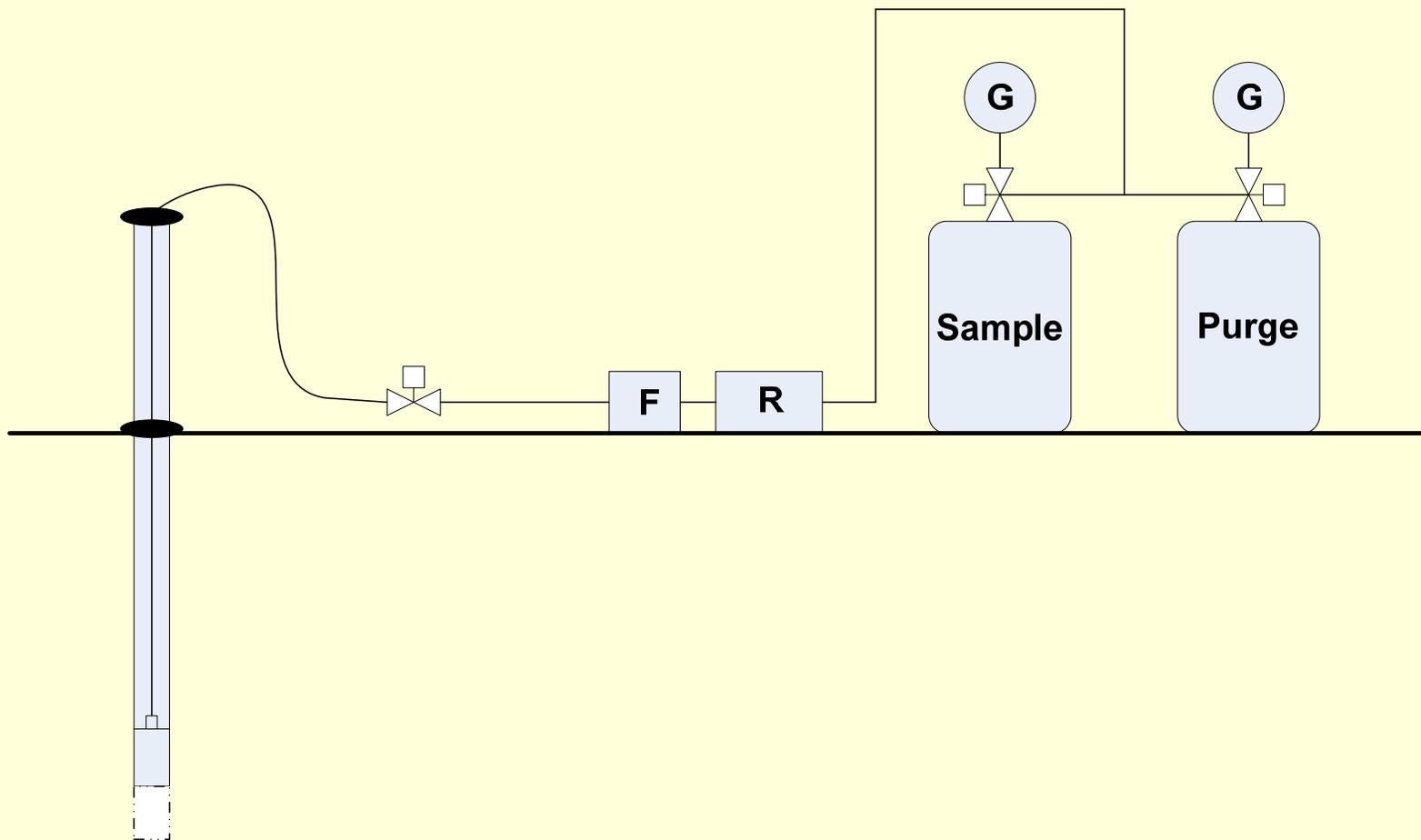
- Verifying no significant leaks in the vapor sampling apparatus
- Questioning the need and accuracy of multiple purge volumes
- Considering the collection of grab vapor samples from subsurface vapor sampling wells completed in low permeability materials

# Is There a Reliability Issue with the Post-Run Tubing (PRT) System in Subsurface Vapor Sampling?

# Geoprobe Post-Run Tubing (PRT) System for Vapor Sampling



# Establishing a Tracer Gas Atmosphere in a PRT System

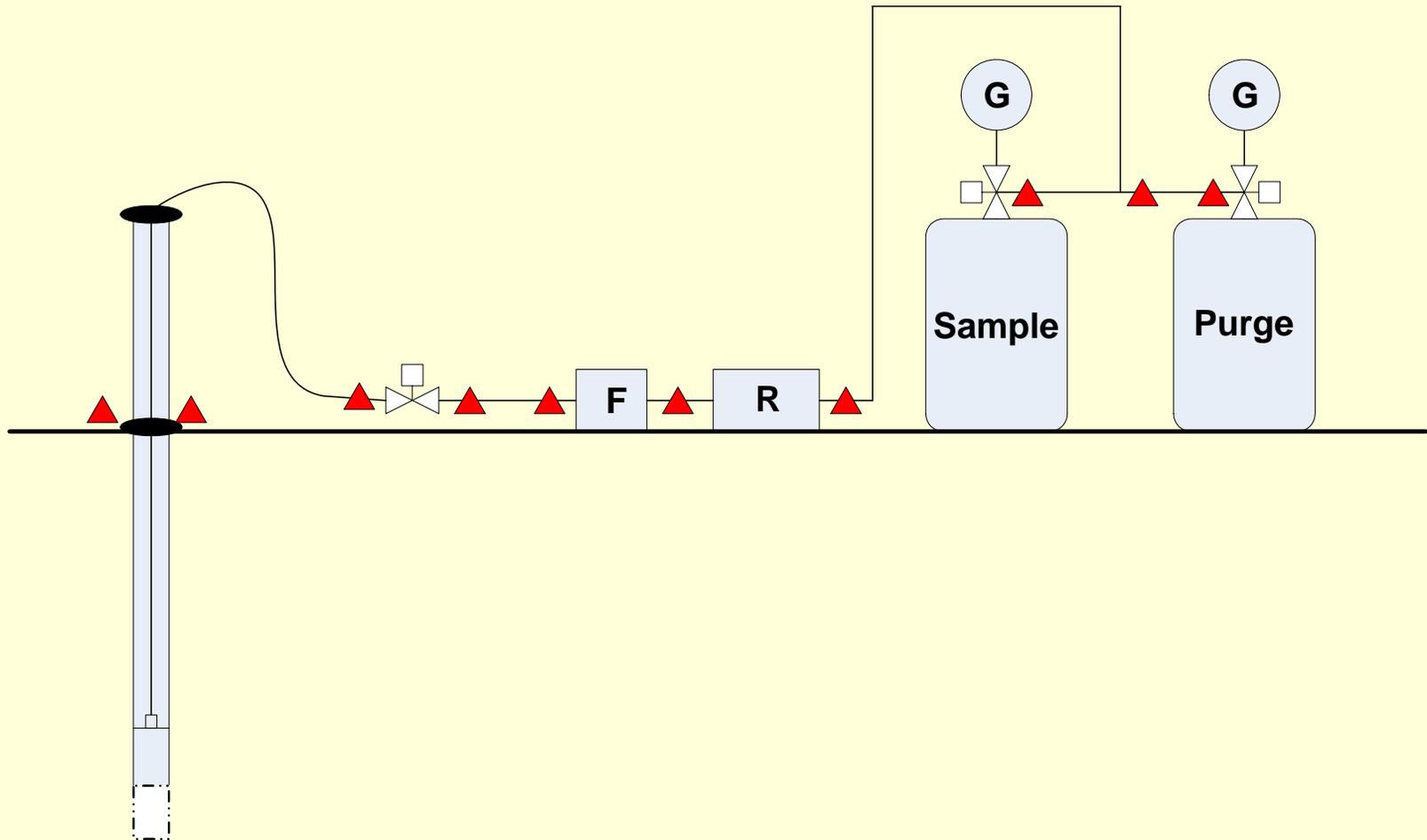


# Subsurface Vapor Results from Using a Geoprobe

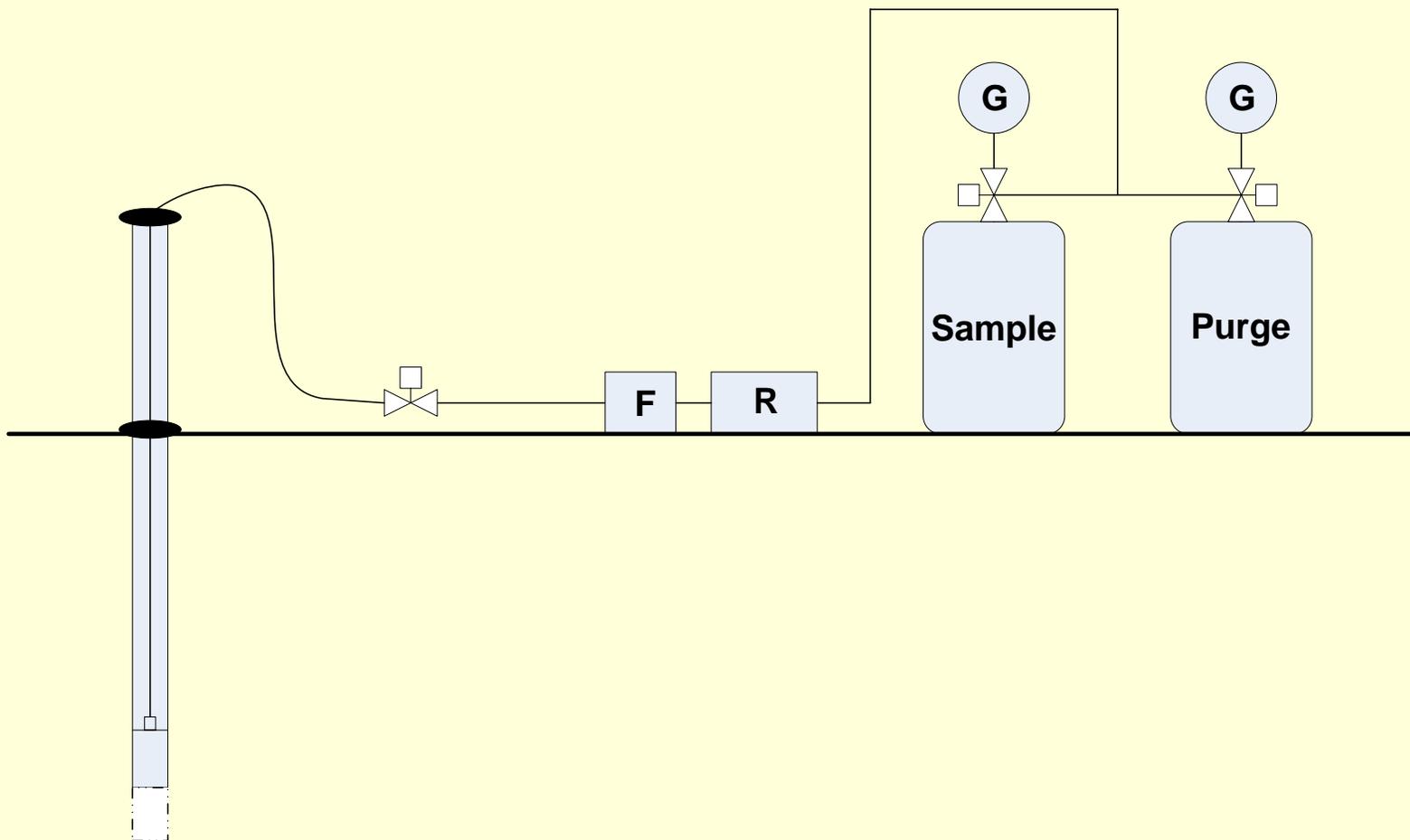
Boring	Sample Depth (feet)	Soil Gas Concentration (ug/m3)				%
		TPHg	Benzene	MTBE	2-Propanol	Oxygen
SG-1	5	1,700,000	<1,800	<2,000	1,900,000	21
SG-2	5	2,000,000	<4,000	<4,600	1,900,000	18
SG-3	5	6,200	<8.8	<9.9	59	19
SG-4	5	3,100,000	<1,400	<1,600	2,700,000	19
SG-5	5	430,000	<740	<840	460,000	20
Region 2 RWQCB Res ESL		10,000	84	9,400		
10,000 ug/m3 = 10 ug/l						

# Testing for Leaks in other Portions of the Sampling Apparatus

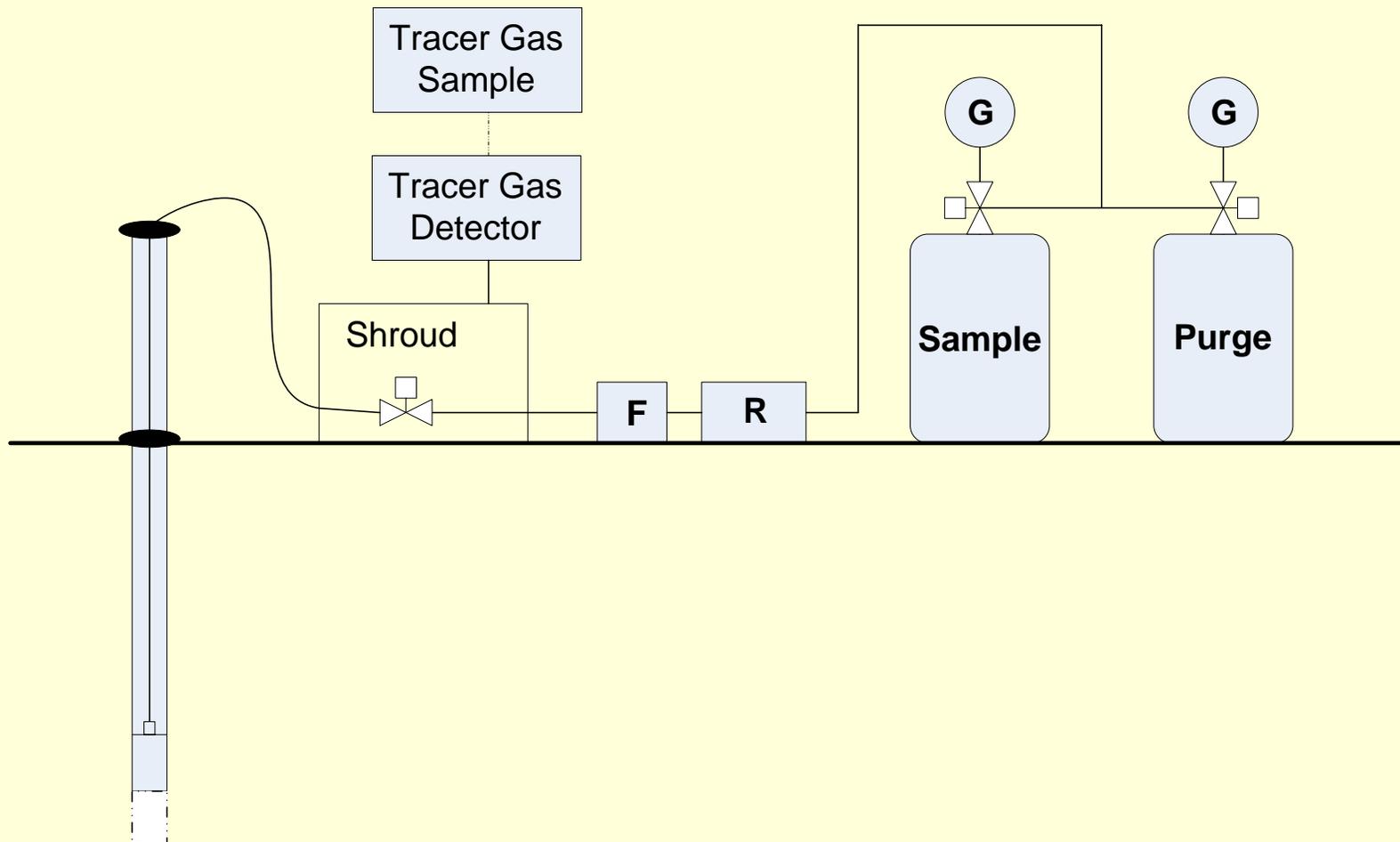
# Old Style Leak Test Method



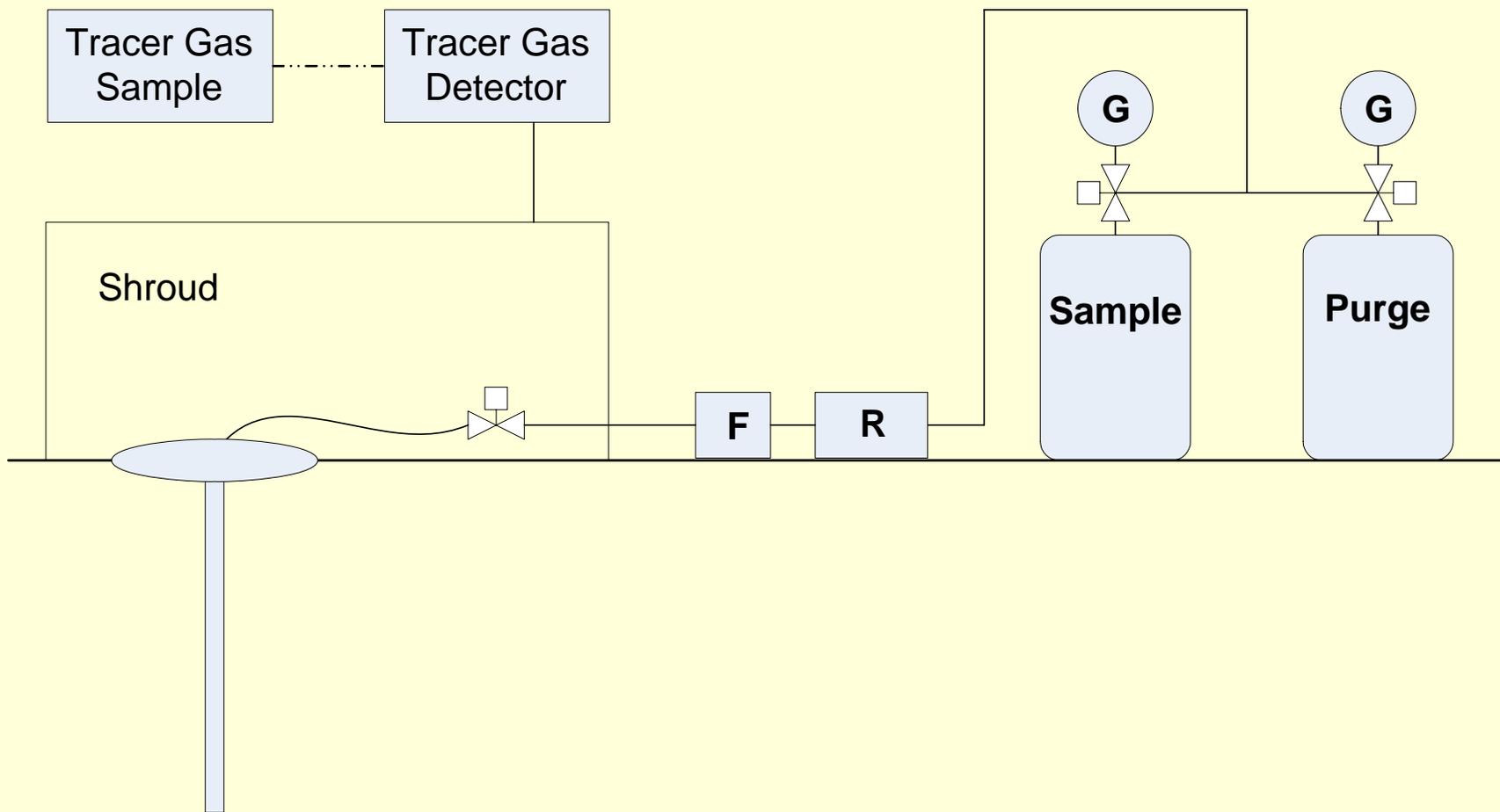
# Performing an Equipment Vacuum Test



# Using a Shroud to Test the Valve Closest to the Sample Location



# Using a Shroud and Summa Canisters to Sample a Vapor Well



# Using a Shroud for Subsurface Vapor Sampling



SV-1 manifold and summa canister setup (photo after sampling with 6L disconnected)

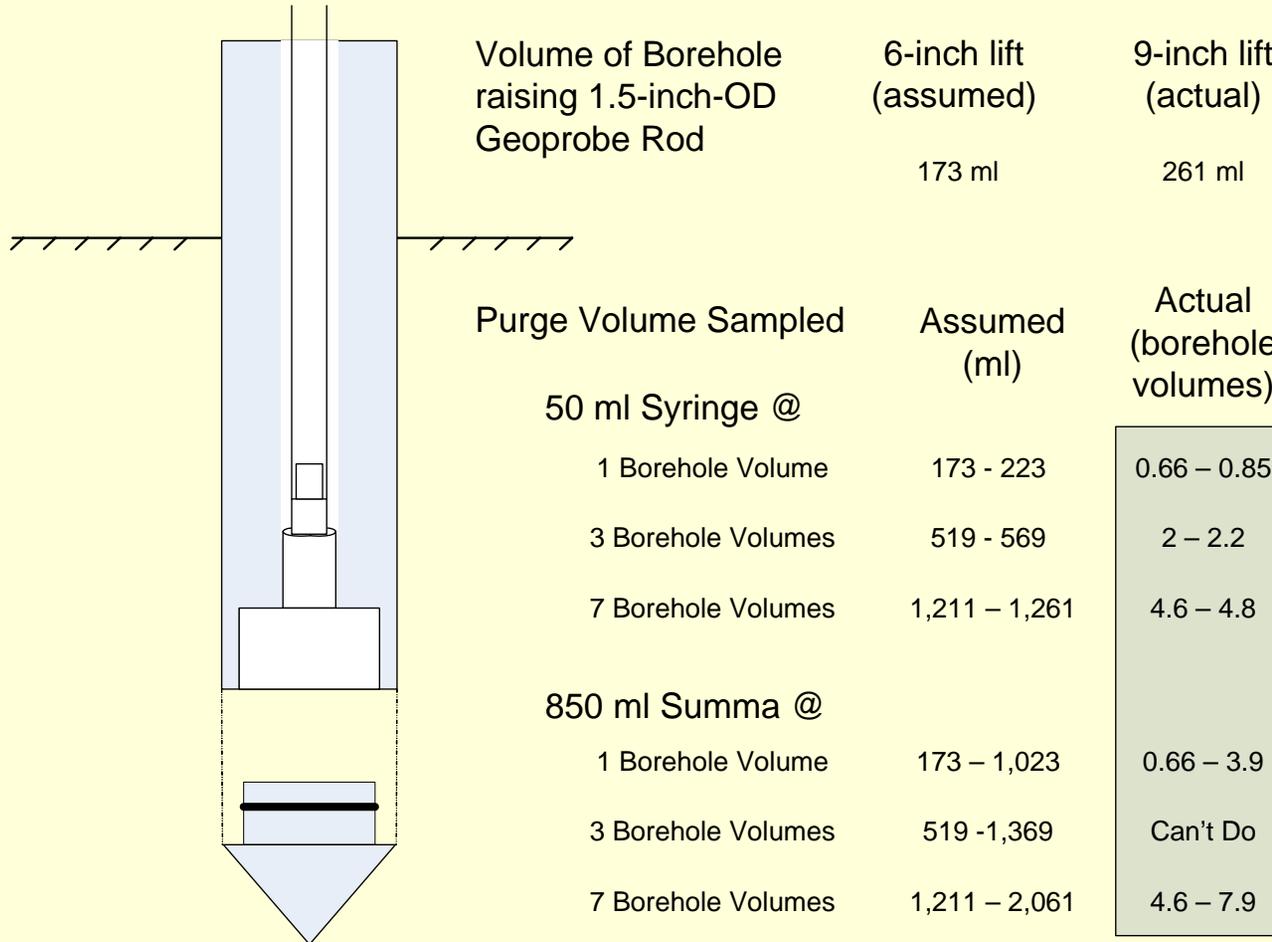


Shroud encasing sampling manifold and summa canisters with datalogging PID

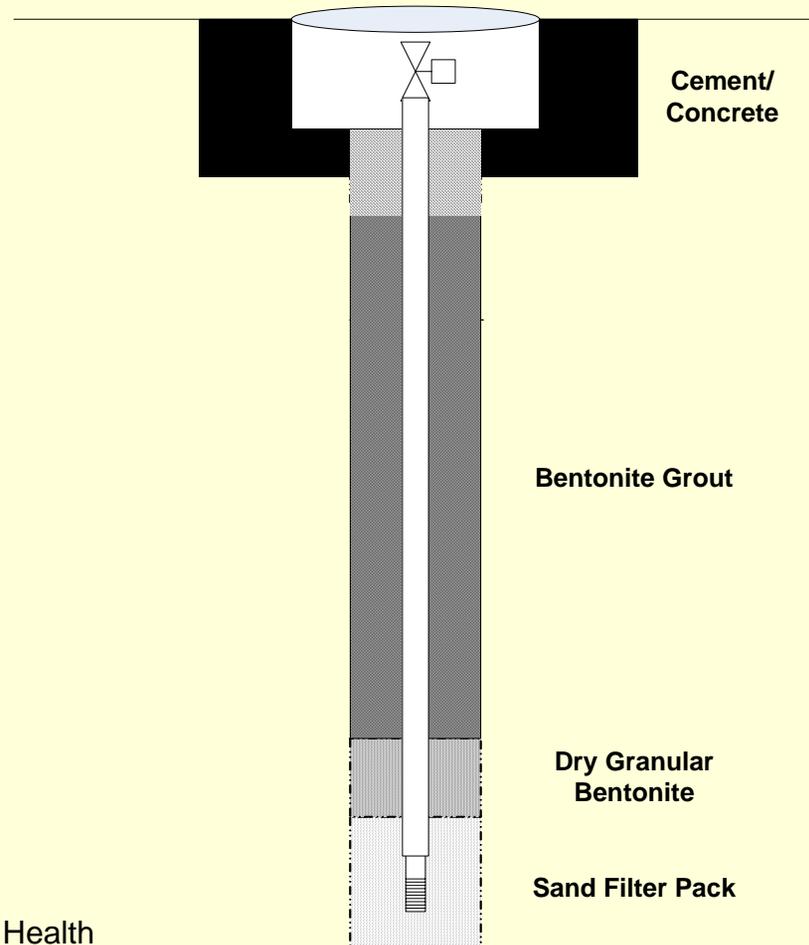
# Sub-Slab Vapor Sampling Results Using a Shroud

Field Point Name	Soil Gas Concentration (ug/m3)				%
	TPHg	Benzene	MTBE	2-Propanol	Oxygen
SV-1	<180	<28	<32	<22	16
Region 2 RWQCB Res ESL	10,000	84	9,400		
2-Propanol Tracer Gas Concentration Under Shroud:					
PID = 45.8 to 49.8 ppm x RF of 6 = ~275 to 299 ppm (~676,000 to 735,000 ug/m3)					
Tedlar Bag Grab Sample = 890,000 ug/m3					
10,000 ug/m3 of 2-Propanol in the sample would only be ~1.1 to 1.5% of shroud atmosphere					

# Does Purge Volume Matter?



# Grab Samples from a Subsurface Vapor Sampling Well



# Recommendations

- Require the establishment, monitoring, and occasional sampling of a leak test atmosphere around connections that cannot be tested by an Equipment Vacuum Test
- Establish a uniform purge volume prior to sampling (e.g. 2 to 3) unless research demonstrates sampling at multiple purge volumes is necessary and the actual volume purged can be verified
- Allow the collection of grab vapor samples from sealed vapor wells completed in low permeability soils after a suitable equilibration time has elapsed