

INTEGRATED GEOSCIENCES LABORATORIES, LLC.

(formerly PTS Laboratories, Inc.)

(Environmental * Geotechnical * Core Analysis)

6016 Centralcrest Street, Houston Texas, 77092. Phone: +1 (713) 316 1800

ANALYSIS METHODS & SAMPLE REQUIREMENTS

TEST DESCRIPTION	ASTM/API/EPA METHOD NUMBERS	MINIMUM SAMPLE REQUIREMENTS	PREFERRED SAMPLE SIZE	YES	NO
Air Permeability, specific or effective	API RP40/ASTM D2434	One tube per sample, minimum 1" x 3", per location	One 2" x 6" tube per sample	X	1
Atterberg Limits	ASTM D4318	500 grams of material	1000 grams of material	X	1
Bulk Density	API RP/40/ASTM D4564/ASTM D2937	100 grams of material	One 2" x 6" tube per sample	X	1
Capillary Pressure, Air/Oil Drainage	ASTM D425M	One tube per sample, minimum 1" x 3", per location	One 2" x 6" tube per sample		
Capillary Pressure, Air/Water Drainage	ASTM D425M/ASTM D2325/ASTM D3152M	One tube per sample, minimum 1" x 3", per location	One 2" x 6" tube per sample		
Capillary Pressure, Water/Oil Imbibition	ASTM D425M	One tube per sample, minimum 1" x 3", per location	One 2" x 6" tube per sample		
Cation Exchange Capacity	EPA 9081	100 grams of material	500 grams of material	X	3
Column Leaching Studies (site specific)	ASTM D4874M	1-1.5" x 6" for volatile tests, 5-1.5" x 6" for extractables	3-2" x 6" for volatile tests, 8-2" x 6" for extractables	X	3
Core Photography	Proprietary	1.5" diameter tube	3.0" diameter tube	X	1
Fluid Gravity, API & Specific	ASTM D1481	100 mls of representative fluid	500 mls of representative fluid	X	2
Fluid Saturation, % pore volume	Dean Stark/API RP40	one tube per sample, minimum 1" x 3", per location	One 2" x 6" tube per sample	X	1
Gas Analysis: C1 - C8+, CO2, O2, N2, & H2S	ASTM D2163M	2-liter Tedlar bags; 1-200 mls stainless steel gas cylinder	1 - One liter stainless steel gas cylinder	X	1
Grain Density	API RP40	50 grams of material	100 grams of material		
Grain Size Analysis, dry	ASTM D422, CUSTOM STACK, DOT SPEC	100 grams of material	500 grams of material		
Grain Size Analysis, laser	ASTM D4464M	50 grams of material	500 grams of material		
Grain Size Analysis, laser + dry	ASTM D422M + ASTM D4464M	100 grams of material	500 grams of material		
Hydraulic Conductivity	EPA 9100/ASTM D5084	One tube per sample, minimum 1" x 3", per location	One 2" x 6" tube per sample		
Interfacial Tension, per phase pair	ASTM D2285	One liter of fluid per fluid tested	Two liters of fluid per fluid tested	X	2
Klinkenberg Air Permeability	ASTM D4525	One tube per sample, minimum 1" x 3", per location	One 2" x 6" tube per sample		
Moisture Content	ASTM D2216/ASTM D4959/ASTM D4643	100 grams of material	500 grams of material	X	1
Moisture, ash & organic matter	ASTM D2947	100 grams of material	500 grams of material	X	1
Pore Size Distribution, Hg Injection	ASTM D4404	One tube per sample, minimum 1" x 3", per location	One 2" x 6" tube per sample		
Porosity, effective	API RP40	One tube per sample, minimum 1" x 3", per location	One 2" x 6" tube per sample	X	1
Porosity, Total	API RP40	One tube per sample, minimum 1" x 3", per location	One 2" x 6" tube per sample	X	1
Remediation Bench Simulations	Proprietary/Custom	Variable	Variable	X	3
Saturated Zone Properties Package	API RP40, ASTM D2216, ASTM D5084, EPA 9100	One tube per sample, minimum 1" x 3", per location	One 2" x 6" tube per sample	X	1
Soil pH	EPA 9045	100 grams of material	200 grams of material	X	1
Specific Gravity of Soils	ASTM D854/API RP40	100 grams of material	200 grams of material		
Silt Density Index	ASTM D4189	10 liters of fluid	10 liters of fluid	X	2
Total Organic Carbon	WALKLEY-BLACK, EPA 9060	50 grams of material	200 grams of material	X	3
Unconfined Compressive Strength	ASTM D2166	One tube per sample, minimum 1.5" x 4", per location	One 2" x 6" tube per sample	X	1
Vadose Zone Properties Package	API RP40, ASTM D2216, ASTM D4525	One tube per sample, minimum 1" x 3", per location	One 2" x 6" tube per sample	X	1
Viscosity, three temps	ASTM D445	200 mls of representative fluid	500 mls of representative fluid	X	2

Preservation Key:

- 1 - Chill to retain fluids
- 2 - Headspace free container, chilling preferred
- 3 - 4°C required