INTEGRATED GEOSCIENCES LABORATORIES, LLC.

(formerly PTS Laboratories, Inc.)

*(Environmental * Geotechnical * Core Analysis)*

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

Diagnostic Tests for Site Specific Characterization and Modeling

ANALYSIS	TYPICAL DATA APPLICATION METTHOD	METHOD
SOIL PROPERTIES		
Soil Porosity, Total or Effective	Volumetric calculations	API RP40
Pore Size Distribution	Permeability, capillary pressure estimation	ASTM D4404
Bulk Density	Transport calculations	ASTM D2937
Volumetric Vapor Content	Vapor phase transport	API RP40
Volumetric Water Content	Vapor phase transport, dissolved concentrations	API RP40
Hydrocarbon Saturation	Plume delineation, vapor calculations, risk assessment	API RP40
Total Organic Carbon	Retardation factor, transport calculations, attenuation	Walkley-Black
Soil Specific Gravity, Grain Density	Lithology and clay indicator	ASTM D854
Cation Exchange Capacity	Retardation factor, attenuation, clay content	EPA 9081
Soil pH	Bioparameter	EPA 9045
Moisture Content	Transport calculations	ASTM D2216
GEOLOGIC PROPERTIES		
Lithology, Mineralogy	Soil Classification, clay quantification	X-Ray, Thin Sec, SEM
Clay Content	Retardation, permeability reduction	X-Ray
Soil Texture, Grain Size Dsitribution	Soil classification, estimation of permeability, porosity, capillary pressure	ASTM D4464M, ASTM D422
Pore Geometry	Permeability, capillary pressure estimation	ASTM D4404
Core Description	Stratigraphy, Lithology, Depositional & Hydrogeologic setting	AAPG
Core Photography	Historical documentation of soil characteristics for regulators, litigation and future use	ASTM D5079, API RP40
HYDROGEOLOGIC, FLUID TRANSPORT PROPERTIES		
Hydraulic Conductivity	Basic transport property	ASTM D2434
Permeability to Air	Soil Vapor models	API RP40
Relative Permeability, Multiple Fluid Flow	Modeling free product recovery, migration off-site, risk calculations	Site Specific
Capillary Pressure, Moisture Potential	Calculate true product thickness, saturation above water table, Soil Vapor calculations	ASTM D6836
Volumetric Residual Hydrocarbon	Calculate depth of contaminant penetration	Multiple
Leaching Studies	Evaluate remediation alternatives	Site Specific
HYDROCARBON PROPERTIES		
Interfacial Tension	Product recovery, mobility, capillary pressure	ASTM D971
Fingerprinting C8 - C35	Characterize hydrocarbon, determine lateral and vertical continuity, product recovery, plume migration	IP 318/78M
Reid Vapor Pressure	SVE Models	ASTM D223
Viscosity	Risk calculation, product recovery, mobility	ASTM D445
Density, API Gravity	Product Recovery	ASTM D1481
Distillation	Thermal Soil Vapor Modeling	ASTM D86
Gas Analysis: C1-C9, CO2, O2, N2, H2S	Thermal Soil Vapor Modeling	ASTM D2163M