



### FREE TECHNICAL FIELD GUIDE

By popular request, Enviro-Tech has compiled and enhanced our Technical Field Guide into a mini booklet that also includes a mini-catalog of products. This Field Guide is being distributed to our regular clientele and selected Universities and Colleges, at no cost, for education purposes.

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- Air Monitoring
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- Water Quality Instrumentation
- General Field Products
- Remediation and Cleanup
- Health and Safety Products
- Well Construction Equipment
- Rental Equipment

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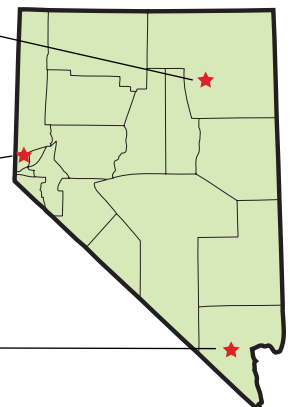
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## North American West Coast



# Per- and Polyfluoroalkyl Substances (PFAS) Sampling Guidelines:

## An Overview on the Measurement of Water Quality Parameters to Determine Stability in Ground Water

PFAS contamination poses site characterization, sampling and analytical challenges. PFAS have unique chemical and physical properties and they often occur in complex mixtures that can change over time. At environmental investigation sites, very low concentrations of several different PFAS must be sampled and analyzed. Many materials used in the course of environmental investigation can potentially contain PFAS.

USEPA has compiled an online resource for PFAS that include topics such as policy and guidance, chemistry and behavior, occurrence, toxicology, site characterization, and remediation technologies (USEPA 2017h). The National Groundwater Association (NGWA) has also published a resource on PFAS that includes information about sampling and analytical methods (NGWA 2017). Further, the California State Water Quality Control Board has published Sampling Guidelines (March, 2019).

### Equipment and Supplies

Many materials used in the course of environmental investigation can potentially contain PFAS. There is limited published research or guidance on how certain materials can potentially contain PFAS. There is limited published research or guidance on how certain materials used by field staff affect sample results. Therefore, a conservative approach is recommended to exclude materials known to contain PFAS. Obtain and review all Safety Data Sheets (SDSs) before considering materials for use during PFAS sampling. Materials to avoid include:

- Teflon, polytetrafluoroethylene (PTFE)
- fluorinated ethylene propylene (FEP)
- waterproof coatings containing PFAS
- ethylene tetrafluoroethylene (ETFE)
- food containers – anything with fluoro in the name
- low density polyethylene (LDPE)

Many waterproof coatings contain PFAS, such as Gore-tex treated PPE or most waterproof papers, but some products are waterproofed with acceptable materials such as polyurethane, rubber, or PVC. Individual product specifications should be examined closely. In the case of Tyvek PPE, plain Tyvek does not contain PFAS while coated Tyvek does. In addition, materials incidentally transported to sites may contain PFAS. For example, fast food wrappers may contain PFAS. Due to the ubiquitous nature of PFAS, sampling crews must review all materials used to avoid contamination. Collection of quality assurance and quality control (QA/QC) samples is a useful tool to assess field contamination.

### TECH TIP

Traditionally, Teflon parts and LDPE tubing have been suitable for sampling. Many of the sampling products that are currently used must be avoided, unless they are PFAS free manufactured. These include electric submersible pumps, and tubing products like LDPE or Teflon tubing. As an equipment guideline, two recognized acceptable products are for shallow sampling of 30-feet or less the peristaltic pump (using silicon and HDPE tubing) or for deeper sampling a PFAS approved Blader pump system.

Also, disposable bailers are a HDPE product and acceptable. Bailer twine can be ordered as PFAS free.

### Tech Tip

This guide is intended as a tool which delineates acceptable EPA protocols for groundwater purging, sampling, and low flow technology.

# Protective Laws and Regulations

Laws and regulations have been designed to protect our waters. Implementation of these laws and regulations is usually accomplished at the state level, with oversight from the Federal government. Water rights are the exception to this; states have the primary role in their administration. Most of the federal legislation is concerned with water quality, whereas water rights primarily deal with water quantity.

## Clean Water Act

The Clean Water Act (CWA) is a 1977 amendment to the Federal Water Pollution Control Act of 1972, which set the basic structure for regulating discharges of contaminants to waters of the United States. The law gave the U.S. Environmental Protection Agency (EPA) the authority to set effluent standards on an industry basis and to set water quality standards for all contaminants in surface waters. The CWA makes it unlawful for any person to discharge any contaminant from a point source into navigable waters unless a permit is obtained under provisions of the act.

## Safe Drinking Water Act

The Safe Drinking Water Act of 1974 was established to protect the quality of drinking water in the United States. This law focuses on all waters actually or potentially designated for drinking, whether from surface or groundwater sources. The act authorized EPA to establish safe standards of purity and required all owners or operators of public water systems to comply with health-related standards.

## Resource Conservation and Recovery Act (RCRA)

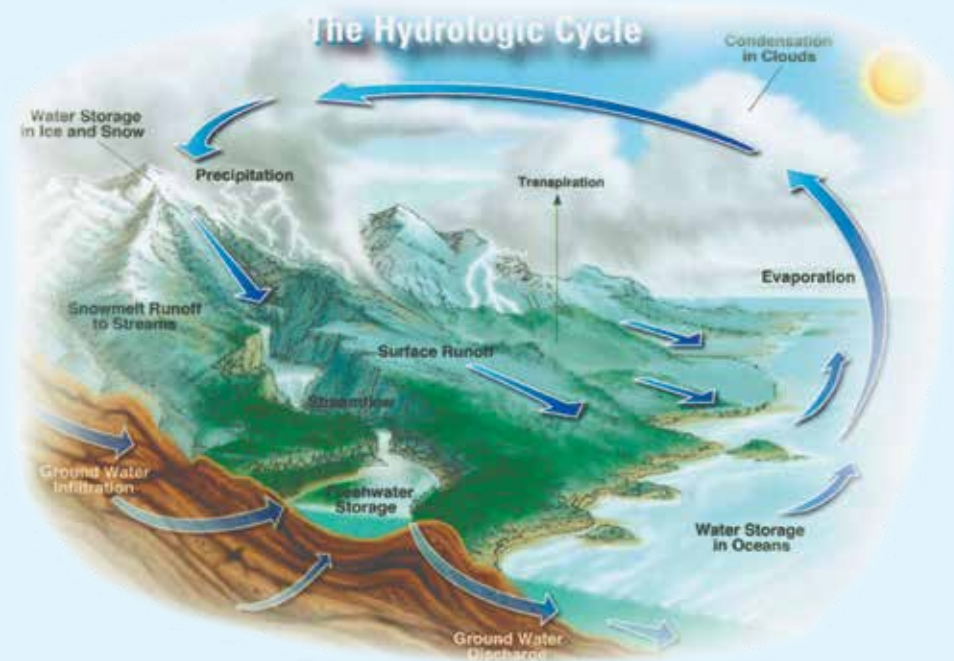
RCRA gave EPA the authority to control hazardous waste from the "cradle to grave," including the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of nonhazardous wastes. The 1986 amendments to RCRA enabled EPA to

address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. RCRA focuses only on active and future facilities and does not address abandoned or historical sites.

## Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

CERCLA, commonly referred to as "Superfund," provides Federal funding to help clean

up uncontrolled or abandoned hazardous-waste sites as well as accidents, spills, and other emergency releases of contaminants into the environment. Through the act, EPA was given power to seek out those parties it considers responsible for any release of contaminants and obtain their cooperation and monetary contributions in the cleanup.



Historical Photograph 1991 showing 6 delivery vehicles. During the first years of the UST Fund, Enviro-Tech supplied well construction products for the installation of thousands of monitoring wells in Northern California. Now with the Low-Threat UST Case Closure Policy in effect since 2012, we provide well destruction products for those same wells.

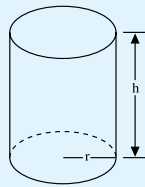


## Volume Formula

$$\text{Volume} = \pi r^2 \times h$$

Curved surface area =  $2 \times \pi r \times h$   
 End surface area =  $2 \times \pi r^2$

## Cylinder:



## Water Data & Formulas

1 gallon water = 231 cubic inches = 8.333 pounds (@ 65°F)  
 1 pound of water = 27.72 cubic inches (@ 65°F)  
 1 cubic foot of water = 7.5 gallons = 62.4 pounds (salt water weighs approximately 64.3 pounds per cubic foot)  
 pounds per square inch at bottom of a column of water = height of column in feet x 0.434 (39°F)  
 1 miner's inch = 9 to 12 gallons per minute

## Horsepower to Raise Water

$$\text{Horsepower} = \frac{\text{gallons per minute} \times \text{Total Head in feet}}{3960}$$

(if pumping a liquid other than water, multiply the gallons per minute above by the liquid's specific gravity)

## Gallons Per Minute through a Pipe

$$\text{GPM} = 0.0408 \times \text{Pipe Diameter inches}^2 \times \text{Feet / minute water velocity}$$

## Weight of Water in a Pipe

$$\text{Pounds Water} = \text{Pipe Length feet} \times \text{Pipe diameter inches}^2 \times 0.34$$

## Gallons per Minute of a Slurry

$$\text{GPM Slurry} = \text{GPM Water} + \frac{4 \times \text{Tons of per hour of solids}}{\text{Specific Gravity of Solids}}$$

## Approximate Amount of Water in a Well

Diameter of casing or hole in inches	Gallons per foot of depth	Cubic feet per foot of depth	Liters per foot of depth
1	0.041	0.0055	0.509
1½	0.092	0.0123	1.142
2	0.163	0.0218	2.204
2½	0.255	0.0341	3.167
3	0.367	0.0491	4.558
3½	0.500	0.0668	6.209
4	0.653	0.0873	8.110

## Capacity of Tanks

Tank diameter	Gallons per foot depth
12"	5.86
18"	13.20
24"	23.42
30"	36.6
36"	52.6
42"	71.6
48"	93.6
54"	119.0
60"	146.0
72"	211.0



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## Hydraulic Conversion Data\*

by U.S. Geologic Survey, Water Resources Division

### Volume

1 cubic ft	= 7.4805 US gallons	= 6.2321 imperial gallons	= 28.317 liters
1 U.S. gallon	= 0.13368 cubic ft	= 0.83271 imperial gallon	= 3.7854 liters
1 imperial gallon	= 0.16040 cubic ft	= 1.2009 US gallons	= 4.5437 liters
1 liter	= 0.035315 cubic ft	= 0.26417 US gallon	= 0.22009 imperial gallon
1 cubic ft	= 0.028317 cubic meter	= 0.00022957 acre-ft	
1 cubic meter	= 35.315 cubic ft	= 0.00081071 acre-ft	
1 acre-ft	= 43,560 cubic ft	= 1,233.5 cubic meters	
1 cubic mile	= 3.3792 million acre-ft		
1 cf-s-day	= 86,400 cubic ft	= 1 cubic ft per second for 24 hr	

### Volume conversion Factors

Initial Unit	Coefficient (multiplier) to obtain:					
	Cfs-days	Mil. cu ft	Mil. gal.	Acre-ft	In. per sq mi.	Mil. cu. meters
Cfs-days	—	0.086400	0.64632	1.9835	0.037190	.0024466
Mil. cu. ft	11.574	—	7.4805	22.957	.43044	.028317
Mil. gal.	1.5472	.13368	—	3.0689	.057542	.0037854
Acre-ft	.50417	.043560	.32585	—	.018750	.0012335
In. per sq. mi.	26.889	2.3232	17.379	53.333	—	.065785
Mil. cu. meters	408.73	35.314	264.17	810.70	15.201	—

### Velocity

Velocity	Pressure (0° C = 32° F)	
	Velocity	Pressure
1 mile per hr	= 1.467 ft per sec	1ft of head, fresh water = 0.433 lb per sq in, pressure
1 mile per hr	= 88 ft per mm	1 lb per sq in, pressure = 2.31 ft of head, fresh water
1ft per sec	= 0.682 mile per hr	1 meter of head, fresh water = 1.42 lb per sq in, pressure
1 ft per mm	= 0.0114 mile per hr	1 lb per sq in, pressure = 0.704 meter of head
1ft per sec	= 0.3046 meter per sec	1 atmosphere (msi.) = 33.907 ft of water
1 meter per sec	= 3.281 ft per sec	

### Weight

1 cubic ft of fresh water	= 62.4 lb	= 28.3 kg
1 cubic ft of sea water	= 64.1 lb	= 29.1 kg
1 cubic meter of fresh water	= 1000kg	= 1 metric ton

### Rates of Flow

1 cubic ft per sec	= 448.83 US gallons per min	= 646,317 US gallons per day	= .028317 cu meter per sec
1 cubic ft per min	= 7.4805 US gallons per min	= 10,772 US gallons per day	= .00047195 cu meter per sec
1 U.S. gallon per min	= 0.002228 cubic ft per sec	= 0.13368 cubic ft per min	= 1440 U.S. gallons per day = .00063090 cu meter per sec
1 U.S. gallon per day	= .000093 cubic ft per min	= .0006944 US gallon per min	
1 cubic ft per sec	= 1.9835 acre-ft per day	= 723.97 acre-ft per year	
1 acre-ft per day	= 0.50417 cubic ft per sec	= 365 acre-ft per year	= .014276 cu meter per sec
1 acre-ft per year	= 0.00138 cubic ft per sec	= 0.00274 acre-ft per day	
1 inch per hr on 1 acre	= 1 cubic ft per sec (approx)		
1 inch per hr on 1 sq mi	= 645.33 cubic ft per sec		

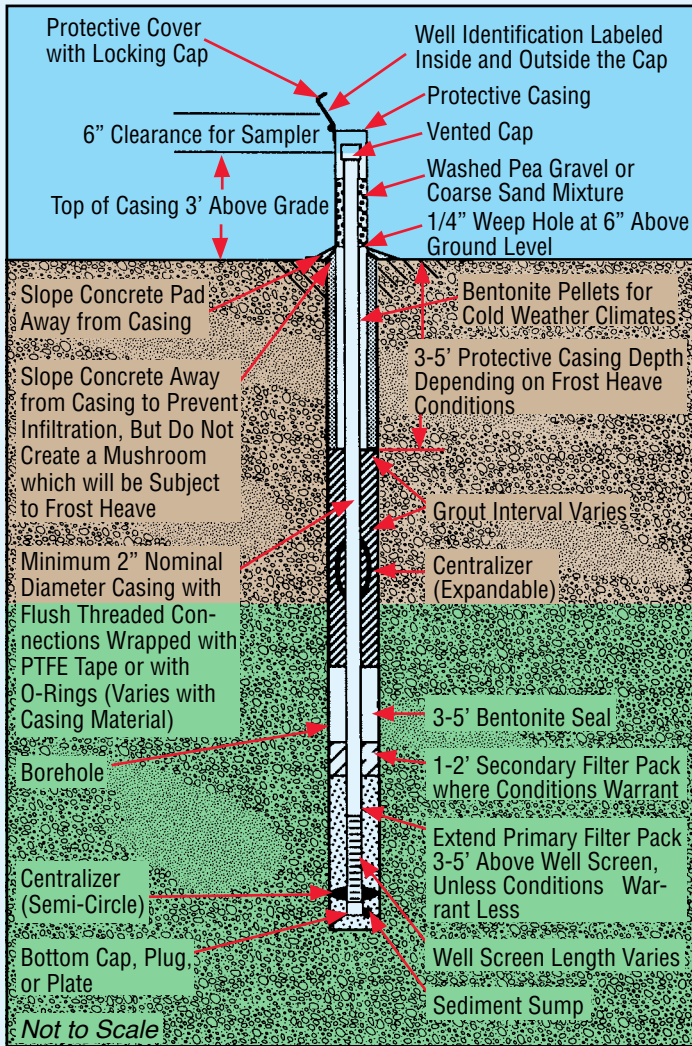
### Rate Conversion Factors

Initial Unit	Coefficient (multiplier) to obtain:					
	Cu ft per sec	Gal per mm	Mil gal per day	Acre-ft per day	Inches per day per sq mi	Cu meters per sec
Cu ft per sec (cfs)	—	448.83	0.64632	1.9835	0.037190	.028317
Gal per mm (gpm)	0.0022280	—	.0014400	.0044192	.00008286	.000063090
Mil gal per day (mgd)	1.5472	694.44	—	3.0689	.057542	.043813
Acre-ft per day	.50417	226.29	.32585	—	.01850	.014276
Inches per day per sq mi	26.889	12,069	17.379	53.333	—	.76140
Cu meters per sec	35.314	15,850	22.834	70.045	1.3134	—

### Miner's inch is a rate of discharge that has been fixed by statute in most of the western states:

1 cubic ft per sec	= 50 miner's in (Idaho, Kansas, Nebraska, New Mexico, North Dakota, South Dakota)
1 cubic ft per sec	= 40 miner's in (Arizona, California, Montana, Oregon)
1 cubic ft per sec	= 38.4 miner's in (Colorado)
1 miner's inch	= .02 cubic ft per sec (Idaho, Kansas, Nebraska, New Mexico, North Dakota, South Dakota)
1 miner's inch	= .025 cubic ft per sec (Arizona, California, Montana, Oregon)
1 miner's inch	= .026 cubic ft per sec (Colorado)

\*This Chart can also be found in the AGI Data Sheets (53.1)



Typical monitoring well design components.

## Well Volumes

Diameter (Inches)	Gallons/root	Feet/gallon
2	0.16	6.25
3	0.37	2.70
4	0.65	1.54
5	1.02	0.98
6	1.47	0.68
7	2.00	0.50
8	2.61	0.38
9	3.30	0.30
10	4.08	0.245
12	5.87	0.17
14	8.0	0.125
16	10.5	0.095
18	13.2	0.076
20	16.3	0.061
24	23.5	0.043
36	52.9	0.028

Note: Volume of annular space = volume of hole - volume of casing O.D.

### WEIGHTS & DIMENSIONS

#### PVC PIPE & SLOTTED SCREEN Schedule 40

Pipe Size	Pipe OD.	Pipe ID.	App. Ship Wt.	Rows of Slots
1 1/4"	1.660"	1.380"	0.43 lbs/ft.	3
2"	2.375"	2.067"	0.70 lbs/ft.	3
4"	4.500"	4.026"	2.00 lbs/ft.	6
6"	6.625"	6.065"	3.45 lbs/ft.	8
8"	8.625"	7.981"	5.22 lbs/ft.	10

#### Schedule 80

Pipe Size	Pipe OD.	Pipe ID.	App. Ship Wt.	Rows of Slots
2"	2.375"	1.939"	0.93 lbs/ft.	3
4"	4.500"	3.826"	2.70 lbs/ft.	6

## Rig Dimensions and Capabilities

Rig Name	Model	Torque Rating Ft. Lbs.	Length	Width	Height (Mast Down)	Height (Mast Up)	Max. Soil Boring Depth	Max. Monitoring Well Depth	Casing Diameter	Max. Angle Hole Capacity
CME	95	31,000	34'	8'	12'	38'	300'	300'	4"	N/A
CME	75HT	13,000	30'	8'	10.5'	28'	200'	200'	4"	45 deg.
								100'	8"	
MOBILE	B-61	12,000	30'	8'	11.5'	28'	150'	120'	4"	N/A
MOBILE	B-57	7,000	30'	8'	11.5'	28'	140'	100'	4"	30 deg.
ACKER	AD-II	6,500	24'	8'	10.5'	25'	100'	80'	4"	N/A
4 WD										
SOIL										
MASTER	50	2,000	18'	8'	7.5'	12.5'	60'	50'	2"	30 deg.
CME	LIMITED ACCESS	10,000	10'	5'	7.5'	10.10'	140'	140'	4"	N/A
75										
ACKER	LIMITED ACCESS	6,500	13'	5'	8'	12.3'	120'	80'	4"	N/A
50								50'	8"	
SOIL										
MASTER	LIMITED ACCESS	2,000	10'	5'	5.5'	10.5'	50'	40'	2"	30 deg.
SMEAL	5T	N/A	20'	8'	8.8'	24'	N/A	1000'	up to 10"	N/A
Development										

## Unified Soil Classification System

Compiled by B. W. Pipkin, University of Southern California

MAJOR DIVISIONS		GROUP SYMBOLS	TYPICAL NAMES		
COARSE-GRAINED SOILS More than half of material is larger than no. 200 sieve size.	GRAVELS More than half of coarse fraction is larger than no. 4 sieve size	GW	Well-graded gravels, gravel-sand mixtures, little or no fines.		
		GP	Poorly graded gravels, gravel-sand mixtures, little or no fines.		
		GM	Silty gravels, gravel-sand-silt mixtures.		
		GC	Clayey gravels, gravel-sand-clay mixtures.		
	SANDS More than half of coarse fraction is smaller than no. 4 sieve size	SW	Well-graded sands, gravelly sands, little or no fines.		
		SP	Poorly graded sands, gravelly sands, little or no fines.		
		SM	Silty sands, sand-silt mixtures.		
		SC	Clayey sands, sand-clay mixtures.		
		FINE-GRAINED SOILS More than half of material is smaller than no. 200 sieve size.	SILTS AND CLAYS	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts, with slight plasticity.
				CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
OL	Organic silts and organic silty clays of low plasticity.				
High Liquid limit.	MH		Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.		
	CH		Inorganic clays of high plasticity, fat clays.		
	OH		Organic clays of medium to high plasticity, organic silts.		
Highly organic soils		Pt	Peat and other highly organic silts.		

### NOTES:

- Boundary Classification: Soils possessing characteristics of two groups are designated by combinations of group symbols. For example, GW-GC, well-graded gravel-sand mixture with clay binder.
- All sieve sizes on this chart are U.S. Standard.
- The terms "silt" and "clay" are used respectively to distinguish materials exhibiting lower plasticity from those with higher plasticity. The minus no. 200 sieve material is silt if the liquid limit and plasticity index plot below the "A" line on the plasticity chart (next page), and is clay if the liquid limit and plasticity index plot above the "A" line on the chart.
- For a complete description of the Unified Soil Classification System, see "Technical Memorandum No. 3-357," prepared for Office, Chief of Engineers, by Waterways Equipment Station, Vicksburg, Mississippi, March 1953. (See also Data Sheet 29.1)

## Checklist for Field Descriptions of Soils

Roy W. Simonson. Principal sources are U.S. Department of Agriculture Handbooks 18 and 436.

### GENERAL INFORMATION AND SETTING

- IDENTIFICATION:** Name of soil series or broader class, as specific as feasible.
- PHYSIOGRAPHY:** Such as till plain, high terrace, flood plain.
- UNDERLYING MATERIALS:** General nature, such as calcareous clayey till or residuum from granite.
- SLOPE:** Approximate gradient.
- PLANT COVER:** Vegetation at site, such as oak-hickory forest, corn, pasture.
- MOISTURE STATUS:** Conditions at the time, such as wet, moist, dry.
- REMARKS:** Other features such as stoniness, salinity or depth to ground water; not applicable or observable everywhere.

### DESCRIPTIONS OF INDIVIDUAL HORIZONS

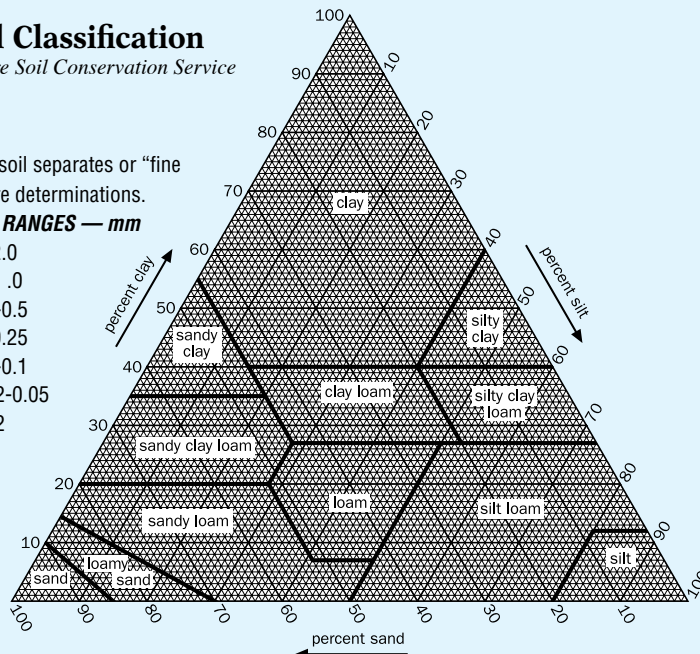
- DESIGNATION:** See hypothetical soil profile, Data Sheet 36.
- DEPTH:** cm (or inches) from top of a horizon and from surface of organic soil.
- THICKNESS:** Average, such as 15 cm, plus range, such as 10-20 cm.
- BOUNDARY:** Lower one, as to distinctness: abrupt, clear, gradual, or diffuse; and as to topography: smooth, wavy, irregular or broken.
- COLOR:** Record colors of both wet and dry specimens if possible, but always for wet conditions. Use number-letter notations from Munsell Soil Color charts, e.g., 10YR 5/4. Record mottles (patches of one color in matrix of another color) as to abundance: few, common, many; as to size: fine, medium, coarse; and as to contrast: faint, distinct, prominent.
- TEXTURE:** Classes should show relative proportions of the separates sand, silt, and clay. See triangular graph showing textures, Data Sheet 37.2.
- STRUCTURE:** Describe natural units as to grade (distinctness): weak, moderate, strong; as to size: very fine, fine, medium, coarse, very coarse; and as to type: platy, prismatic, blocky, granular. Without peds, horizon can be either single-grained or massive.
- CONSISTENCE:** Cohesion, adhesion, and resistance of specimens to deformation and rupture. When wet: nonsticky, slightly sticky, sticky, or very sticky; also: nonplastic, slightly plastic, plastic, or very plastic. When moist: loose, very friable, friable, firm, very firm, or extremely firm. When dry: loose, soft, slightly hard, hard, very hard or extremely hard.
- ROOTS:** Numbers of observable roots: few, common, or many; and dimensions: fine, medium, or coarse.
- PORES:** Numbers of field-observable pores: few, common or many; dimensions: very fine, fine, medium, or coarse; and shapes: irregular, tubular or vesicular.
- REACTION:** pH as measured with field kit.
- ADDITIONAL FEATURES:** Other features if present, such as iron or carbonate concretions (use same abundance and dimension classes as for roots), effervescence with dilute HCl, krotovinas (filled animal burrows), cementation (weakly, strongly, indurated), and stone lines.

## Guide for Textural Classification

U.S. Department of Agriculture Soil Conservation Service  
May 1, 1950

Names and sizes of classes of soil separates or "fine earth" forming bases for texture determinations.

NAME	SIZE RANGES — mm
Very coarse sand	1.0-2.0
Coarse sand	0.5-1.0
Medium sand	0.25-0.5
Fine sand	0.1-0.25
Very fine sand	0.05-0.1
Silt	0.002-0.05
Clay	0.002



## Particle Size Descriptions

Size Term Particle Diameter

### Sedimentary Units:

Boulder	> 256 mm
Cobble	64 to 256 mm
Pebble	4 to 64 mm
Granule	2 to 4 mm
Very Coarse Sand	1 to 2 mm
Coarse Sand	1/2 to 1 mm
Medium Sand	1/4 to 1/2 mm
Fine Sand	1/8 to 1/4 mm
Very Fine Sand	1/16 to 1/8 mm
Silt	1/256 to 1/16 mm
Clay	< 1/256 mm

### Pyroclastic Units:

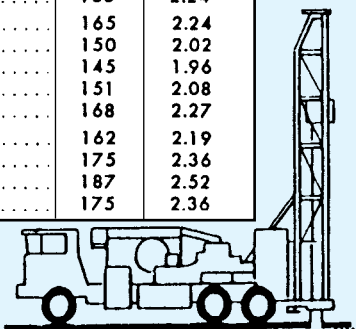
Bomb or block	> 32 mm
Lapilli	4 to 32 mm
Coarse Ash	1/4 to 4 mm
Fine Ash	< 1/4

### Igneous Rocks:

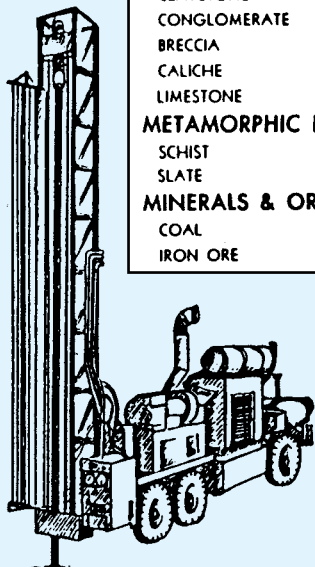
Pegmatitic	> 30 mm
Coarse Grained	5 to 30 mm
Medium Grained	1 to 5 mm
Fine Grained	< 1 mm

## Weight of rocks

Solid rock in place	Lbs. per Cu. Ft.	Tons per Cu. Yd.
Andesite	181	2.44
Basalt	187	2.52
Calcite	162	2.18
Coal Anthracite	100	1.35
Coal Bituminous	81	1.08
Diabase	175	2.36
Diorite	181	2.44
Dolomite	178	2.41
Felsite	165	2.24
Gneiss	170	2.30
Granite	168	2.27
Gypsum	175	2.36
Hematite	305	4.10
Limestone	165	2.24
Limonite	235	3.17
Magnesite	200	2.70
Magnetite	312	4.23
Marble	153	2.08
Propyry	159	2.15
Quartz	165	2.24
Quartzite	165	2.24
Rhyolite	150	2.02
Salt Rock	145	1.96
Sandstone	151	2.08
Schist	168	2.27
Shale	162	2.19
Slate	175	2.36
Trap	187	2.52
Talc	175	2.36



- TOPSOIL
- CLAY
- GLACIAL TILL
- IGNEOUS ROCKS
- GRANITE
- BASALT
- TRAP ROCK
- SEDIMENTARY ROCKS
- SHALE
- SANDSTONE
- SILTSTONE
- CLAYSTONE
- CONGLOMERATE
- BRECCIA
- CALICHE
- LIMESTONE
- METAMORPHIC ROCKS
- SCHIST
- SLATE
- MINERALS & ORES
- COAL
- IRON ORE



## Hardness of minerals and rocks

Rock or mineral	Compressive strength, psi (kg/cm <sup>2</sup> )	Hardness (Moh's Scale)
Diamond		10.0
Carborundum		9.5
Sapphire		9.0
Chrysoberyl		8.5
Topaz		8.0
Zircon		7.5
Quartzite	60,000 (4200)	7.0
Chert	55,000 (3900)	6.5
Trap Rock		6.0
Magnetite	15,000 (1050)	5.5
Schist (c)	30,000 (2100)	5.0
Apatite (c)		4.5
Granite (c)	35,000 (2500)	4.0
Dolomite (c)	28,000 (1980)	3.5
Limestone (b)	18,000 (1200)	3.0
Galena (b)		2.5
Potash (a)	9,000 (630)	2.0
Gypsum (a)		1.5
Talc (a)		1.0

Note: Hardness is the resistance to abrasion of a smooth surface. An approximation may be made by scratching the material with a fingernail (a), a copper coin (b), and a knife (c). Compressive strength of rock varies considerably; values shown are average.

## GEOLOGICAL TIME SCALE

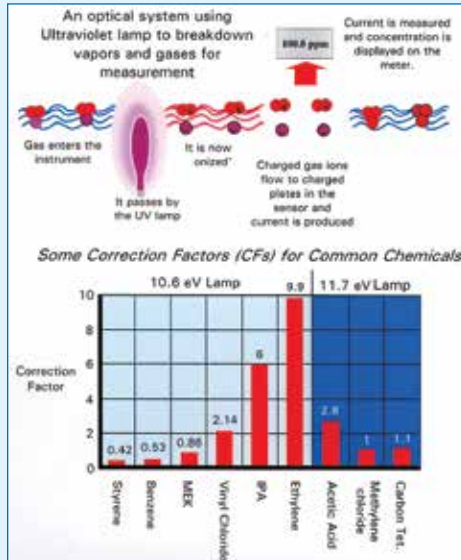
ERA	PERIOD	EPOCH	SUCCESION OF LIFE
CAINOZOIC 'Recent life'	QUATERNARY	Recent	
	0-2 million years	Pleistocene	
	TERTIARY	Pliocene	
68 million years	Miocene		
	Oligocene		
	Eocene		
	Palaeocene	70 Million years ago	
MESOZOIC 'Middle life'	CRETACEOUS		
	65 million years		
	JURASSIC		
	45 million years		
	TRIASSIC		
	45 million years	225 Million years ago	
PALAEOZOIC 'Ancient life'	PERMIAN		
	45 million years		
	CARBONIFEROUS		
	80 million years		
	DEVONIAN		
	50 million years		
PRECAMBRIAN ERAS	SILURIAN		
	30 million years	430 million years ago.	
	ORDOVICIAN		
	70 million years		
PROTEROZOIC	CAMBRIAN		
	100 million years	600 million years ago.	
ARCHAEAN			?

APPROXIMATE AGE OF THE EARTH MORE THAN 4,500 MILLION YEARS



# What is a photoionization detector (PID)?

The MultiRAE Plus, ToxiRAE 3 and ppBRAE 3000 use an electrodeless 10.6 eV ultraviolet lamp to ionize chemicals with ionization potentials (I.P.) below 10.6 eV and thereby measure their concentrations in parts-per-million. They are best used to detect low levels (0-2000 ppm) of broad band toxics or volatile organic compounds (VOCs). Breakthroughs in lamp and sensor technology allow the detectors to be small, rugged and affordable.



## Advantages of a PID Sensor

1. Very sensitive - low ppm readings measured with confidence.
2. Instantaneous display, updated every second, for real time monitoring of toxic chemicals.
3. STEL, TWA and Peak values, updated every minute, accessible to the user at the end of the work shift.
4. Threshold monitoring - visual and audio alarms in real time for

STEL, TWA and Peak. Alarm signals vary for each condition.  
5. Datalog for compliance and workshift trend analysis.  
6. Historically, PIDs were calibrated to isobutylene because the response to this chemical is midpoint compared to a wide range of chemicals. A large table of calibration factors is available, alleviating the need to purchase many calibration gases.

Broad band toxic compound monitoring in the work place. Until now, the only way to get a 'GO' or 'NO GO' reading for broad band toxics or VOCs was through the use of a broad band toxic sensor (MOS type) or a LEL sensor. These are not sensitive enough to provide accurate warnings of most toxic vapors until the permissible exposure levels are greatly exceeded. MOS and LEL sensors are best used in the percentage range, not the ppm range. One percent is 10,000 ppm. Benzenes permissible exposure limit is 1 ppm, due to its highly carcinogenic nature. MOS and LEL sensors neither have the sensitivity nor the resolution to detect these levels. It is like measuring the thickness of a coin with a yard stick or a meter ruler.

## "Protection" versus "Detection"

PIDs have traditionally been considered as "detection" instruments, particularly used by first responders and The entry teams to determine the extent of a spill. MultiRAE Plus and ToxiRAE 3 are "protection" monitors, optimized for ambient air monitoring, alerting workers to potentially hazardous conditions. Other applications include PID ppm monitoring for combustible gases such as Jet fuel, Gasoline and Solvents.

## MultiRAE Plus and ToxiRAE 3 can "See" when the permissible exposure levels are exceeded

While effective and proven absorption tubes do not provide real time alarms, if permissible exposure levels are exceeded, personnel could be unaware for days or weeks after the occurrence. The detectors provide instantaneous alarms to indicated when exposure limits have been exceeded for a wide range of chemicals.

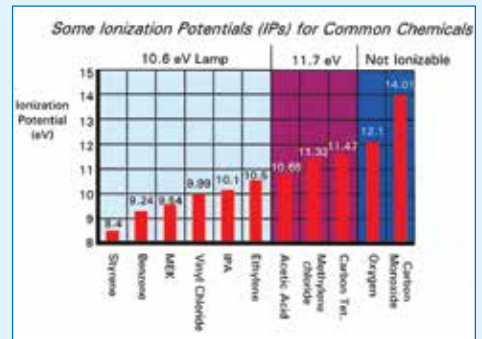
When levels are exceeded, the datalogging feature of the MultiRAE Plus, ToxiRAE 3 and ppBRAE 3000 allows the

individual to "see" which part of the day or night the levels were a problem, whereas a tube cannot indicate if it happened all at once or accumulated throughout the course of the workers' shift.

The MultiRAE Plus, ToxiRAE 3 and ppBRAE 3000 data can be instantly accessed from a personal computer. One can immediately ask an individual what happened to create the situation that exceeded the exposure limits while the individual can still recollect what happened. The answer could be as simple as cleaning with solvents or failure of a ventilator. Therefore with instantaneous alarms one datalogging, safety action can be taken much quicker when using the MultiRAE Plus, ToxiRAE 3 and ppBRAE 3000 than any other device.

## Measuring a "witches brew" of chemicals for a particular toxic.

Many have frequently measured the relative percentage of a particular toxic using specific and quantitative techniques against PID readings, for example, benzene in gasoline vapor. A surrogate method can be extracted from this extensive database, implying that about half the Permissible Exposure Limit (PEL) is not exceeded if the broad band reading is below a certain value. For example, if the total petroleum hydrocarbon reading is below 50 ppm, then benzene is below 0.5 ppm. PID sensors are a broad band sensor ideal for this level of measurement.



# Volatile Organic Compounds Detected by PIDs

## 10.6 eV lamp

Acetaldehyde (Acetic Acid)  
Acetic Anhydride  
Acetone  
Acrolein  
Acrylamide  
Acrylonitrile  
Allyl Alcohol  
Allyl Chloride  
Allyl Glycidyl Ether  
Allyl Propyl  
Disulfide  
Amino Pyridine  
Amyl Acetate  
Aniline  
Anisidine  
Benzene  
Benzyl Chloride  
Bromoform  
Butadiene  
Diethoxyethanol  
Butyl Acetate  
Butyl Alcohol  
Butyl Mercaptan  
Butylamine  
Butyl Glycidyl Ether  
Butyl Toluene  
Camphor Vapor  
Carbon Disulfide  
Chloroacetaldehyde  
Chloroacetophenone  
Chlorobenzene  
Chloromethyl

Methyl Ether  
Chloronitropropane  
Chloroprene  
Chrysene  
Cresol  
Crotonaldehyde  
Cumene  
Cyclohexane  
Cyclohexanol  
Cyclohexanone  
Cyclohexene  
Cyclopentadiene  
Di-ethylhexyl Phthalate  
Diacetone Alcohol  
Diazomethane  
Dibutylphthalate  
Dichlorobenzene  
Dichloro Ethyl Ether  
Dichloroethylene  
Dichlorvos  
Diesel  
Diethylamino Ethanol  
Diethylamine  
Diglycidyl Ether  
Diisobutyl Ketone  
Diisopropylamine  
Dimethylamine  
Dimethylaniline  
Dimethylformamide  
Dimethylhydrazine  
Dimethyloacetamide  
Dimethylphthalate  
Dinitrotoluene

Dinitro Cresol  
Dinitro Aniline  
Dinitro Benzene  
Dioxane  
Diphenyl  
Dipropylene Glycol Methyl Ether (Epichlorohydrin) (Ethanol)  
Ethanolamine  
Ethoxyethyl Acetate  
Ethyl Acetate  
Ethyl Acrylate  
Ethyl Amyl Ketone  
Ethyl Benzene  
Ethyl Bromide  
Ethyl Butyl Ketone  
Ethyl Ether  
Ethyl Mercaptan  
Ethyl Silicate  
Ethylamine  
Ethylene Dibromide  
Ethylenediamine  
Ethylenimine  
Furfural  
Furfuryl Alcohol  
Gasoline  
Glycidol  
Heptane  
Hexane  
Hexanone  
Hexone  
Hexylacetate  
Hydroquinone

Isoamyl Acetate  
Isobutyl Acetate  
Isobutyl Alcohol  
Isophorone  
Isopropyl Acetate  
Isopropyl Alcohol  
Isopropyl Ether  
Isopropylamine  
Isopropyl Glycidyl  
JP 4, 6, 8  
Ketene  
Mesityl Oxide  
Methyl Acetate  
Methyl Acetylene  
Methyl Acrylate  
Methyl Amyl Ketone  
Methyl Bromide  
Methyl Cellosolve Acetate  
Methyl Ethyl Ketone  
Methyl Hydrazine  
Methyl Iodide  
Methyl Mercaptan  
Methyl Methacrylate  
Methyl Styrene  
Methylamine  
Methylcyclohexane  
Methylcyclohexone  
Methylcyclohexanol  
Monomethylaniline  
Morpholine  
Naphthalene  
Naphthylamine

Nitroaniline  
Nitrobenzene  
Nitrochlorobenzene  
Nitromethane  
Nitrosodimethylamine  
Nitrotoluene  
Octane  
Pentaborane  
Pentane  
Pentanone  
Perchloroethylene  
Phenol  
Phenyl Ether  
Phenylene Diamine  
Phenylhydrazine  
Phosphine  
Phosphorus  
Trichloride  
Phthalic Anhydride  
Propyl Acetate  
Propyl Alcohol  
Propylene Dichloride  
Propylene Imine  
Propylene Oxide  
Pyridine  
Quinone  
Stibine  
Stoddard Solvent  
Vapor  
Styrene  
Terphenyls  
Tetrachloroethylene  
Tetrachloronaphthalene  
Tetrahydrofuran

Tetramethyl Lead  
Toluene  
Toluene  
Toluene  
Toner Fluid Vapor  
Trichloroethylene  
Triethylamine  
Turpentine Vapor  
Vinyl Chloride  
Vinyl Toluene  
White Spirit  
Xylene

## 11.7 eV lamp

Acetic Acid  
Carbon Tetrachloride  
Chlorobromomethane  
Chloroform  
Dichloroethane  
Epichlorohydrin  
Ethyl Chloride  
Ethanol  
Ethylene Chlorohydrin  
Ethylene Dichloride  
Ethylene Oxide  
Ethyl Formate  
Formaldehyde  
Formic Acid  
Hexachloroethane  
Liquid Petroleum Gas  
Maleic Anhydride  
Methyl Alcohol  
Methyl Chloride  
Methyl Chloroform

Methylene Chloride  
Methyl Formate  
Methyl Isocyanate  
Nitroethane  
Nitromethane  
Nitropropane  
Phosgene  
Propane  
Propyl Nitrate  
Propargyl Alcohol  
Tetrachloroethane  
Tetraethyl Lead  
Trichloroethane

## Not detected by PID

Acetonitrile  
Carbon Dioxide  
Carbon Monoxide  
Ethane  
Freons  
Hydrogen  
Hydrogen Bromide  
Hydrogen Chloride  
Hydrogen Cyanide  
Hydrogen Fluoride  
Methane  
Nitric Acid  
Nitrogen  
Oxygen  
Ozone  
Sulfur Dioxide  
Water

## English to Metric\*

Known	(symbol)	Multiplier	Product	(symbol)
<b>LENGTH</b>				
inches	(in or ")	2.54 x 10 <sup>4</sup>	micron [=10,000 Angstrom units (A)]	(μ)
inches	(in or ")	25.4	millimeters	(mm)
feet	(ft or')	30.48	centimeters	(cm)
feet	(ft or')	0.3048	meters	(m)
yards	(yd)	0.9144	meters	(m)
miles (statute)	(mi)	1.6093	kilometers	(km)
nautical miles	(nmi)	1.85	kilometers	(km)
<b>AREA</b>				
square inches	(in <sup>2</sup> )	6.4516	square centimeters	(cm <sup>2</sup> )
square feet	(ft <sup>2</sup> )	0.0929	square meters	(m <sup>2</sup> )
square yards	(yd <sup>2</sup> )	0.8361	square meters	(m <sup>2</sup> )
square miles (1 square mile = 640 acres)	(mi <sup>2</sup> )	2.5900	square kilometers	(km <sup>2</sup> )
acres	(ac)	0.405	hectares	(ha)
<b>VOLUME</b>				
cubic inches	(in <sup>3</sup> )	16.3871	cubic centimeters	(cm <sup>3</sup> )
cubic feet	(ft <sup>3</sup> )	0.02832	cubic meters	(m <sup>3</sup> )
cubic yards	(yd <sup>3</sup> )	0.7646	cubic meters	(m <sup>3</sup> )
cubic miles	(mi <sup>3</sup> )	4.1684	cubic kilometers	(km <sup>3</sup> )
quarts (U.S. liquid)	(qt)	0.9463	titers (=1000 cm <sup>3</sup> )	(l)
gallons (U.S. liquid) (=0.8327 Imperial gal)	(gal)	3.7854	liters	(l)
barrels	(bbl)	0.159	cubic meters	(m <sup>3</sup> )
barrels 32 <sup>o</sup> API	(bbl)	0.137	metric tons	(MT)
(For other densities, see table on next page.)				
barrels (petroleum — 1 bbl = 42 gal)	(bbl)	158.9828	liters	(l)
acre-feet (=43,560 ft <sup>3</sup> =3.259 x 10 <sup>5</sup> gal)	(acre-ft)	1233.5019	cubic meters	(m <sup>3</sup> )
<b>MASS</b>				
ounces (avdp.)	(oz)	28.3495	grams	(g)
ounces (avdp.) 1 troy oz.=0.083 lb)				
pounds (avdp.)	(lb)	0.4536	kilograms	(kg)
short tons (2000 lb)		0.9072	megagrams (= metric tons)	(Mg)
long tons (2240 lb)		1.0160	megagrams	(Mg)
carats (gems)	(c)	0.2000	grams	(g)
<b>VOLUME PER UNIT TIME</b>				
cubic feet per second (= 448.83 gal/in in)	(ft <sup>3</sup> /s)	0.02832	cubic meters per second	(m <sup>3</sup> /s)
cubic feet per second	(ft <sup>3</sup> /s)	28.3161	cubic decimeters per second (= liters per second)	(dm <sup>3</sup> /s)
cubic feet per minute (= 7.48 gal/mm)	(ft <sup>3</sup> /min)	0.47195	liters per second	(l/s)
gallons per minute	(gal/min)	0.06309	liters per second	(l/s)
barrels per day (petroleum — 1 bbl = 42 gal)	(bbl/d)	0.00184	liters per second	(l/s)
<b>PRESSURE</b>				
pound (force) per square inch	(lb-f/in <sup>2</sup> ) (=PSI)	6.8948	kilopascal (kPa)  (1 Pascal = 1 $\frac{\text{Newton}}{\text{m}^2}$ = $\frac{\text{kg m}}{\text{sec}^2 \text{m}^2}$ )	
atmosphere (= 14.6960 PSI = 1.01325 bars)	(atm)	101.325		
bar (= 14.5038 PSI=0.9869 atm)		100.0		
<b>TEMPERATURE</b>				
temperature, degrees Fahrenheit	(°F)	5/9 (after subtracting 32)	temperature, degrees Celsius	(°C)
temperature, degrees Fahrenheit		5/9 (after adding 459.67)	temperature Kelvin	(K)
temperature, degrees Celsius	(°C)	add 273.15	temperature Kelvin	(K)
<b>THERMAL GRADIENT</b>				
1°F/100 ft = 1.8°C/100 in = 18°C/km				
<b>CRUDE OIL VOLUME PER BARREL</b>				
Degrees API	Specific gravity	Metric ton per barrel*		
26	0.898	0.142		
28	0.887	0.140		
30	0.876	0.139		
32	0.865	0.137		
34	0.855	0.135		
36	0.845	0.134		
38	0.835	0.132		
40	0.825	0.130		
42	0.816	0.129		

Note: Approximate figures 60°F.  
\*Interpolate linearly for intermediate APIs.



\*This Chart can also be found in the AGI Data Sheets (51.1)

## Metric to English\*

Known	(symbol)	Multiplier	Product	(symbol)
<b>LENGTH</b>				
micron (=10,000 Angstrom units)	(μ)	3.9370 x 10 <sup>-5</sup>	inches	(in or ")
millimeters	(mm)	0.03937	inches	(in or ")
centimeters	(cm)	0.0328	feet	(ft or')
meters	(m)	3.2808	feet	(ft or')
meters	(m)	1.0936	yards	(yd)
kilometers	(km)	0.6214	miles (statute)	(mi)
kilometers	(km)	0.54	nautical miles	(nmi)
<b>AREA</b>				
square centimeters	(cm <sup>2</sup> )	0.1550	square inches	(in <sup>2</sup> )
square meters	(m <sup>2</sup> )	10.7639	square feet	(ft <sup>2</sup> )
square meters	(m <sup>2</sup> )	1.1960	square yards	(yd <sup>2</sup> )
square kilometers	(km <sup>2</sup> )	0.3861	square miles (1 square mile = 640 acres)	(mi <sup>2</sup> ) (ac)
hectares	(ha)	2.471	acres	(ac)
<b>VOLUME</b>				
cubic centimeters	(cm <sup>3</sup> )	0.06102	cubic inches	(in <sup>3</sup> )
cubic meters	(m <sup>3</sup> )	35.3146	cubic feet	(ft <sup>3</sup> )
cubic meters	(m <sup>3</sup> )	1.3079	cubic yards	(yd <sup>3</sup> )
cubic kilometers	(km <sup>3</sup> )	0.2399	cubic miles	(mi <sup>3</sup> )
liters (=1000cm <sup>3</sup> )	(l)	1.0567	quarts (U.S. liquid)	(qt)
liters	(l)	0.2642	gallons (U.S. liquid)	(gal)
liters	(l)	0.006290	barrels (1 bbl=42 gal)	(bbl)
cubic meters	(m <sup>3</sup> )	6.29	barrels	(bbl)
metric tons 32 <sup>o</sup> API	(MT)	7.28	barrels	(bbl)
(For other densities, see table on next page.)				
cubic meters	(m <sup>3</sup> )	0.0008107	acre-feet (=43,560 ft <sup>3</sup> =3.259 x 10 <sup>5</sup> gal)	(acre-ft) 10 <sup>-5</sup> gal)
<b>MASS</b>				
grams	(g)	5.0000	carats (gems)	(c)
grams	(g)	0.03527	ounces (avdp.)	(oz)
kilograms	(kg)	2.2046	pounds (avdp.)	(lb)
megagrams (= metric tons)	(Mg)	1.1023	short tons (2000 lb)	
megagrams	(Mg)	0.9842	long tons (2240 lb)	
<b>VOLUME PER UNIT TIME</b>				
cubic meters per second	(m <sup>3</sup> /s)	35.3107	cubic feet per second (=448.83 gal/mm)	(ft <sup>3</sup> /s)
cubic decimeters per second (liters per second)	(dm <sup>3</sup> /s)	0.03532	cubic feet per second	(ft <sup>3</sup> /s)
liters per second	(l/s)	2.1188	cubic feet per minute	(ft <sup>3</sup> /min)
liters per second	(l/s)	15.8503	gallons per minute	(gal/mm)
liters per second	(l/s)	543.478	barrels per day (petroleum — 1 bbl = 42 gal)	(bbl/d)
<b>PRESSURE</b>				
kilopascal (kPa)		0.1450  0.009869  0.01	pound (force) per square inch (= PSI)	(lb-f/in <sup>2</sup> )
(1 Pascal = 1 $\frac{\text{Newton}}{\text{m}^2}$ = $\frac{\text{kg m}}{\text{sec}^2 \text{m}^2}$ )			atmosphere	(= 14.6960 PSI)
			bar (=14.5038 PSI)	
<b>TEMPERATURE</b>				
temperature, degrees Celsius	(°C)	9/5 (then add 32)	temperature, degrees Fahrenheit	(°F)
temperature Kelvin	(K)	9/5 (then subtract 459.67)	temperature, degrees Fahrenheit	(°F)
temperature Kelvin	(K)	subtract 273.15	temperature, degrees Celsius	(°C)
<b>THERMAL GRADIENT</b>				
1°F/100 ft = 1.8°C/100 in = 18°C/km				
<b>CRUDE OIL VOLUME PER BARREL</b>				
Degrees API	Specific gravity	Barrels per metric ton*		
26	0.898	7.02		
28	0.887	7.10		
30	0.876	7.19		
32	0.865	7.28		
34	0.855	7.37		
36	0.845	7.46		
38	0.835	7.55		
40	0.825	7.64		
42	0.816	7.73		

Note: Approximate figures 60°F.  
\*Interpolate linearly for intermediate APIs.



\*This Chart can also be found in the AGI Data Sheets (51.3)

## Wind Chill Chart

WIND SPEED IN MPH	Equivalent Wind Chill Temperatures at Actual Temperature Readings (F°)									
	50	40	30	20	10	0	-10	-20	-30	-40
calm	50	40	30	20	10	0	-10	-20	-30	-40
5	48	37	27	16	6	-5	-15	-26	-36	-40
10	40	28	16	4	-9	-21	-33	-46	-58	-70
15	36	22	9	-5	-18	-36	-45	-58	-72	-85
20	32	18	4	-10	-25	-39	-53	-67	-82	-96
25	20	16	0	-15	-29	-44	-59	-74	-88	-104
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109
35	27	11	-4	-20	-35	-49	-67	-82	-98	-113
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116
Over 40 mph (little added effect)	<b>LITTLE DANGER</b> (for properly clothed person)			<b>INCREASING DANGER</b> (Danger from freezing of exposed flesh)			<b>GREAT DANGER</b>			

## Hypothermia

### Mild:

- **Symptoms:** Shivering, loss of coordination, complains of being cold.
- **Treatment:**
  - Move victim to someplace warm and dry. Add more clothing, or replace wet clothing with dry.
  - Cover the person's head and/or neck. Put a barrier between the person and the ground.
  - Cover the person with a space blanket or other vapor barrier. Offer warm nonalcoholic liquids or food.
  - Encourage the person to move around to generate more heat.
  - Apply heat packs to head, neck, underarms, sides of chest, or groin; insulate heavily to prevent further heat loss. Warm shower or bath if available and victim is alert.
  - As a last resort, have someone who is NOT hypothermic get into a sleeping bag with the victim. This method may endanger the rescuer. Two people who are hypothermic should not do this.

### Moderate:

- **Symptoms:** Listless, confused, does not recognize problem; shivers uncontrollably, uncoordinated, speech slurred.
- **First Aid:** Same treatment as above, but cover the person rather than moving him. Do not allow victim to exercise or move, treat very gently. Check for other injuries including frostbite.

### Severe:

- **Symptoms:** Internal temperature of 90°F (32.2°C) or less. Unconsciousness, slow pulse and respiration, no shivering, physical collapse, unresponsive to pain or words.
- **First Aid: Life-threatening - call for professional care.**
  - If pulse and respiration are present, treat as above, but don't give oral fluids unless completely conscious. Do not put the person in a warm shower or bath, and be careful to handle the person gently. Do not rub hands or feet.
  - If pulse and respiration are not present, take the above measures to rewarm the person, start CPR, and get to a medical facility ASAP.

## Heat - Humidity Factor

Rel. Hum. %	Air Temperature (°F)										
	70	75	80	85	90	95	100	105	110	115	120
0%	64	69	73	78	83	87	91	95	99	103	107
10%	65	70	75	80	85	90	95	100	105	111	116
20%	66	72	77	82	87	93	99	105	112	120	130
30%	67	73	78	84	90	96	104	113	123	135	148
40%	68	74	79	86	93	101	110	123	137	151	
50%	69	75	81	88	96	107	120	135	150		
60%	70	76	82	90	100	114	132	149			
70%	70	77	85	93	106	124	144				
80%	71	78	86	97	113	136					
90%	71	79	88	102	122						
100%	72	80	91	108							

**WARNING:** The light grey shaded area above identifies the "danger zones" where the Heat/Humidity index is 90 or above.

## Heat/Humidity Index Danger Zones

- 90° - 104° Heat cramps or heat exhaustion possible
- 105° - 130° Heat cramps or heat exhaustion likely, heatstroke possible
- 130° - more Heat stroke highly likely

## Heat Emergencies

### Heat Cramps

- **Symptoms:** Heavy exertions results in muscle pain and spasms, usually in leg or abdominal muscles.
- **Treatment:** Get victim to a cool place and give him one-half glass of cool water every 15 minutes.

### Heat Exhaustion

- **Symptoms:** Cool, pale, moist skin, heavy sweating, dilated pupils, headaches, nausea, dizziness & vomiting. Body temperature appears to be near normal.
- **Treatment:** Move victim to a cool place. Have victim lie on back with feet elevated. Remove or loosen clothing. Apply cold packs, wet towels or sheets, or fan the victim if these are not available. Give water every 15 minutes, if the victim is conscious.

### Heat Stroke is Life threatening - begin to cool the victim and call for medical help immediately!

- **Symptoms:** Sweat glands shut down - no perspiration. Hot, dry, red skin. Pupils contracted very small. Body temperature very high, even up to 105°. Victim may refuse water, vomit or lose consciousness.
- **Treatment:** ACT IMMEDIATELY! Cool the victim as soon as possible in any way you can. Place in a bathtub of cool water, wrap in wet sheets, or put in an air conditioned room. Do not wait for help to arrive! Treat for shock, and do not give anything by mouth.

## Sound Intensities

Sound intensities are typically measured in decibels (db). A decibel is defined as 10 times the logarithm of the power ratio (power ratio is the ratio of the intensity of the sound to the intensity of an arbitrary standard point). Normally a change of 1 db is the smallest volume change detectable by the human ear.

Sound intensity is also defined in terms of energy (erg) transmitted per second over a 1 square centimeter surface. This energy is proportional to the velocity of propagation of the sound. The energy density is  $\text{erg/cm}^3 = 2\pi^2 \times \text{density in g/cm}^3 \times \text{frequency}^2 \text{ in Hz} \times \text{amplitude}^2 \text{ in cm}$ .

Decibels	Degree	Loudness or Feeling
225	Deafening	12" cannon @ 12 ft. in front below
194		Saturn rocket, 50# of TNT @ 10'
140		Artillery fire, jet aircraft, ram jet
130		Threshold of pain: >130 causes immediate ear damage
		Propeller aircraft at 5 meters, hydraulic press, pneumatic rock drill
120		Thunder, diesel engine room, nearby riveter
110		Close to a train, ball mill
100	Very Loud	Boiler factory, home lawn mower, car horn at 5 meters, wood saw
90		Symphony or a band
		>90 regularly can cause ear damage
		Noisy factory, truck without a muffler
80	Loud	Inside a high speed auto, police whistle, electric shaver, noisy office, alarm clock
70		Average radio, normal street noise
60	Moderate	Normal conversation close up
50		Normal office, quiet stream
45		To awaken a sleeping person
40	Faint	Normal private office noise, residential neighborhood, no cars
30		Quiet conversation, recording studio
20	Very Faint	Inside an empty theater, ticking of watch, rustle of leaves, whisper
10		Sound proof room, Threshold of hearing
0		Absolute silence

## Permissible Noise Exposures

Hours Duration per Day	Sound Level in Decibels (Slow Response)
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
0.25	115

The above restrictions are based on the Occupational Safety and Health Act of 1970. That Code basically states that if the above exposures are exceeded, then hearing protection must be worn. Note that these are based on the "A scale" of a standard sound level meter at slow response and will change if some other standard is used. See the OSHA Section 1910.95 for additional details on the differences.



Purchase Online  
with P.O. or  
Project Number



### Bound Bookbills

The "professional's" bound book – the only book manufactured with true outdoor durable components.



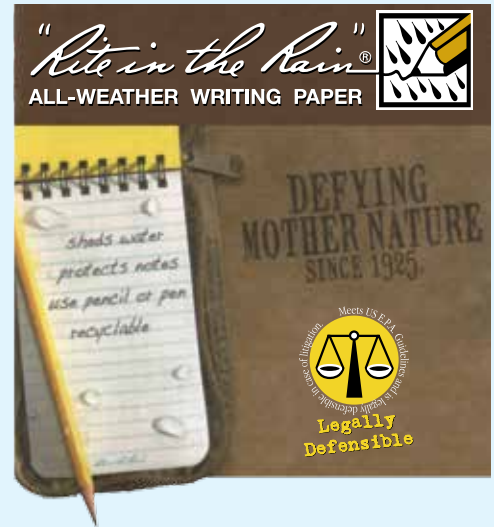
### Stapled Notebooks

4 5/8" x 7". Most popular field notebook in history. High quality, yet economical.



### Spiral Notebooks

4 5/8" x 7". Folds back cover to cover. Poly cover, wire-o spiral.



### 5 All-Weather Copier Paper

Copy or laser print your own all-weather forms, charts, maps and worksheets on patented "Rite in the Rain" All-Weather Copier Paper.



### 6 Field Desk

Weatherproof, the "Rite in the Rain" Field Desk lets you take your office outdoors, regardless of the weather!



### 7 4" x 6" Notebook Belt Loop Pouch

The Pouch comes equipped with a fold-over flap, a sturdy buckle closure and ample room for your 4" x 6" Notebook and extra supplies – maps, pencils, pens, flashlights, etc...

### All-Weather Pens

These All-Weather Pens write on wet paper and upside down in temperatures from -30°F to 250°F.



Cat. No.	Description	Price
1 RR-540F	Rite-in-the-Rain Geological Bound Book w/ Ref. pages	\$30.00
1 RR-540F-KIT	Rite-in-the-Rain Geological Kit w. scales, ruler, poach, and bound book	65.00
2 RR-550F	RITR hardbound 156 numbered page book w/ Environmental notes and references	35.00
3 RR-351	Rite-in-the-Rain stapled 48 page book; 12 pk	55.00
4 RR-353MX	Rite-in-the-Rain spiraled bound 84 page book	21.00
RR-350NF	Rite-in-the-Rain hardbound 156 numbered page book	28.00
RR-C980	Fabric Note Book Cover	20.00
RR-C540F	Fabric Notebook Pouch	29.95
5 RR-8511	All-weather Copy Paper, 8.5"x11", 200 sheet pack	35.00
RR-8511M	All-weather Copy Paper, 8.5"x11", 25 sheet pack	15.00
6 RR-295	RITR Field Desk	25.00
7 RR-C1700	RITR 4"x6" Notebook Belt Pouch	20.00
RR-146-KIT	RITR Notebook Pouch Kit	35.00
8 RR-37	Rite-in-the-Rain All-Weather Pen	15.00



## Geotechnical Guide Card

The McCollough Geotechnical Gauge, designed for field use as a guide to the classification of soils by type, grain size and basic color. Six color swatches and four sand samples are permanently mounted on the card, together with charts of sieve classifications, clay and sand classifications. Supplied as a water resistant, flexible plastic card on a lanyard.

Cat. No.	Description	Price
AMS-504.20	McCollough Geotechnical Guide Card	\$20.22



**NEW and Improved!**

Now includes two new soil charts, more water resistant pages, and recessed paint chips!

## Munsell® Soil Color Chart Binder

*Color classification of soils using 250 mounted chips.*

The Munsell color chart enables color classification of soils using 250 mounted color chips. Developed with the U.S. Soil Conservation Service, this guide is the industry standard. The chart now includes two new soil charts – 7.5R and 5R! The pages are more water resistant, and recessed paint chips are less likely to chip or fall off. The recessed chips also make it easier to compare your sample's color.

Cat. No.	Description	Weight	Price
AMS-504.00	Munsell Soil Color Chart Binder	0.8 lb.	\$ 218.28

## Purge Pump – Whaler Design

A Brief History – The Whaler purger pump was the first downhole DC pump designed for the groundwater industry. Enviro-Tech initially patented the two stage pump and sold it under our popular brand name, “The Purger.” Now this pump has been improved and modified and is available in three versions. Of all the purger pumps available on the market, the Whaler deserves credit for being very reliable, long lasting, and durable. So much so, in fact, it carries a one year warranty.

### Pricing, Specifications & Data

Product #	ES-40W	ES-60W	ES-90W
Manufacturer	Whale	Whale	Whale
First Introduced	1993	1993	2006
Common Name	Mini Purger	Super Purger	Mega Purger
Warranty	1 Year Cond.	1 Year Cond.	1 Year Cond.
Well depth	Up to 40'	Up to 60'	Up to 90'
Lead line	50-feet	70-feet	95-feet
Output (max.)	3gpm	2.8gpm	5gpm
Diameter	1.5"	1.875"	1.27"
Length	6"	13"	14"
Expected life	200 hrs.	200 hrs.	200 hrs.
Power *	12 Volt DC	12 Volt DC	12 Volt DC
Notes:	Reintroduced by Popular Demand Very efficient motor		No Booster Required



ES-90 Mega Purger Pump



ES-60 Super Purger

Cat. No.	Description	Price
ES-40W	Mini Purger Pump – Whaler .....Pumps up to 40'	\$220.00
ES-60W	Super Purger Pump – Whaler .....Pumps up to 60'	330.00
ES-90W	Mega Purger Pump – Whaler .....Pumps up to 90'	440.00
<b>No Booster Required on any Pump</b>		

**1 Year Warranty**

## Pressurized Disposable Bailers

The SingleSample® pressurized disposable bailer system is designed to provide an easy method for filtering metal samples in the field.

The pressurized bailer's rugged polyethylene construction permits use for both bailing and sampling wells while eliminating cross contamination and decon time.



**For Metals Analysis**

Cat. No.	WxL	Description	Units	Price
VOS-PBO10	1.5" x 36"	Pressure Bailer	12/cs.	\$101.40
VOS-PBHP	–	Hand Pump	\$/ea.	69.95
VOS-PB-VOC	–	VOC Sample Removal Device	\$/ea.	9.00
ET-GF-1	–	High Capacity Filter	\$/ea.	18.95

## Field Technicians Work & Write Glove

### Atlas Fit Natural Rubber-coated Glove

The natural rubber coating of the Atlas Fit Glove, combined with its cotton-polyester shell, provides superior abrasion resistance with a comfortable fit.



Cat. No.	Size	Unit	Price Each Pack	
			1	6
<b>Atlas Fit Rubber-Coated Gloves</b>				
FS11-18-999-4410	S	12 PR/Pack	\$45.00	\$42.00
FS11-18-999-4410A	M	12 PR/Pack	45.00	42.00
FS11-18-999-4410B	L	12 PR/Pack	45.00	42.00
FS11-18-999-4410C	XL	12 PR/Pack	45.00	42.00



### TOP PRODUCT

The Purger is still one of the best groundwater purging options

## Bailers

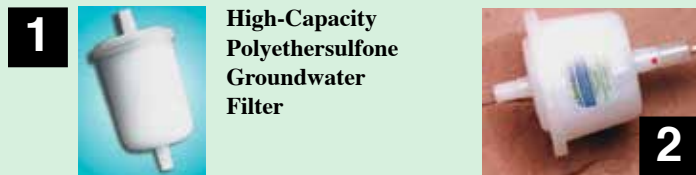
Disposable Bailers. Enviro-Tech carries all brands of bailers at the lowest prices. If you are buying bailers, call us and we will give you better pricing than what you are currently paying.



Cat. No.	W x L	Description	Brand	Units	Price
ESP-CV153	1.5"x36"	Clear PVC Bailers; Weighted	Enviro-Tech CV	24/cs.	\$119.00
AQ-PY05X36SW	.5"x36"	Polyethylene Bailers; Weighted	Enviro-Tech AQ	24/cs.	94.90
AQ-PY75X36SW	.75"x36"	Polyethylene Bailers; Weighted	Enviro-Tech AQ	24/cs.	112.00
VOS-91946-SW-ET	1.5"x36"	Polyethylene Bailers; Weighted	Voss	24/cs.	142.00
VOS-91 946-S-ET	1.5"x36"	Polyethylene Bailers; Unweighted	Voss	24/cs.	112.00
VOS-PE3-SW	3"x36"	Polyethylene Bailers; Weighted	Voss	9/cs.	106.10
VOS-PE3-S	3"x36"	Polyethylene Bailers; Unweighted	Voss	9/cs.	85.50

## Filters

Groundwater Sampling Filters. (.45 Micron)



Product	Specs	Qty.	Cat. No.	Price
1 High Capacity Groundwater Filter (QuickFilter®)	1/8 in. NPT 0.45µm 609 cm <sup>2</sup>	1/pack 10/pack 50/pack	AQ-GF-1 AQ-GF-10 AQ-GF-100	\$ 22.00 210.00 880.90

Cat No.	Product	List	Ext.
2 ET-GF-1	GWE High Capacity Filter Single	\$18.00 ea.	\$ 18.00
ET-GF-10	GWE High Capacity Filter 10/pk.	17.50 ea.	162.50
ET-GF-25	GWE High Capacity Filter 25/pk.	15.32 ea.	380.75
ET-GF-50	GWE High Capacity Filter 50/pk.	13.20 ea.	635.00

## Accessories

Enviro-Tech carries a full line of Sampling Accessories. Shown are a few of the popular products. If you don't see what you need, call us, we will provide cost competitive pricing.



Cat. No.	Size	Description	Unit	Price
NCS-18	1/8"x1000'	Nylon Suspension Cord	1 roll	28.00
GLND-PF-*	*S, L, M, XL	Blue Nitrile Gloves	50 pair	19.00
FS-ALC-CTN	4 lbs.	Alconox Detergent	\$/ea	37.30
FS-LIQ-QT	1 Quart	Liquinox Detergent	\$/ea	24.50
FS-LIQ-GL	1 Gallon	Liquinox Detergent	\$/ea	72.60
VOS-78214	-	Aluminum Reel Only		206.00
VOS-78215	100 ft.	Disposable Nylon Cartidges	24	86.50
VOS-78216	200 ft.	Disposable Nylon Cartidges	20	89.50

## Tubing

Enviro-Tech is a stocking distributor of discharge tubing, in all varieties. Shown are the popular sizes. As a stocking distributor, we sell to you for less.



Tubing Type	Application	I.D.	O.D.	Cat. No.	Per Foot
Nylon Reinforced PVC Tubing	Discharge Tubing for Sampling/Purging	1/2"	5/8"	RYN-0512-080	\$60.00/100ft.
		3/8"	1/2"	RYN-0512-072	55.00/100ft.
Clear Vinyl PVC Tubing	Discharge Tubing for Sampling/Purging	1/2"	5/8"	RYN-0500-135	47.00/100ft.
		3/8"	1/2"	RYN-0500-107	37.00/100ft.
Polyethylene Tubing	Discharge Tubing for Sampling/Purging * Commonly used w/ Peristaltic Pumps	1/8"	1/4"	RYN-0525-018	.40/ft.
		1/4"	3/8"	RYN-0525-024	.58/ft.
		3/8"	1/2"	RYN-0525-032	.77/ft.
Silicon Tubing	Peristaltic Pump Head Tubing Size 15	3/16"	3/8"	RYN-0575-054	2.32/ft.
Pure-Line-1 Teflon® Tubing	EPA Approved Discharge Tubing Polyethylene lined with Teflon®	3/16"	1/4"	STG-020	1.96/ft.
		1/4"	3/8"	STG-040	3.40/ft.



## Grundfos Pumps

For fast, high production well purging, Enviro-Tech carries the Grundfos Redi-Flo2 pump and controller plus all accessories. Shown here are the basic prices, now on sale.

Cat. No.	Redi-Flo2 Products & Accessories	Price
INW-1A107001	Redi-Flo2 VFD w/Case 115V/230V	\$2,200.00
INW-1A107303	Pump with 100' Motor Lead	2,226.00
INW-1A107703	Pump with 200' Motor Lead	2,578.00
INW-125061	Pump End Service Kit	317.00

## Peristaltic Pumps

Enviro-Tech is offering the GeoPump series for sale. The most popular models are shown, call for any model not shown here.

Cat. No.	Description	Price
91352012	Geopump AC/DC, Series 1, Easy Load	\$1,295.00
91352112	Geopump AC/DC, Series 2, Easy Load	1,330.00
	All pumps include hard carry case	

## Proactive Pumps

Enviro-Tech carries a full line of Purge pumps from Proactive for fast and easy well purging at depths up to 250-feet. Shown are the more popular models. Call for discount pricing on any Proactive pump.

Cat. No.	Description	Pumping Depth	Price
P-10150	Mini-Typhoon	40-Feet	\$157.00
P-10250	Tempest/Twister	60-Feet	212.00
P-10275	Super Twister	85-Feet	293.00

## Water Level Meters

While Enviro-Tech carries all brands of Water Level meters, we are choosing the industry's most recognized and best meter brand (Solinst) as our sales item.



Cat. No.	Cable Length	List
SOL-100-*	100 feet	\$ 482.00
SOL-200-*	200 feet	622.00
SOL-300-*	300 feet	762.00
SOL-650-*	650 feet	1,320.00
SOL-CB	Carrying Bag, Med	81.00

## Dataloggers

In the Datalogger realm, we only carry Solinst Dataloggers as we recognize this brand as one of the best, easiest to use and most reliable.



Model 3001 Junior

Cat. No.	Description	List
SOL-108858	Junior LT M5, F15	\$ 417.00
SOL-108860	Junior LT M10, F30	417.00
Levelogger Accessories		
SOL-107380	Standard Comm. Package (USB)	149.00

## pH, Cond., Temp., ORP, Resistivity & TDS

### Waterproof UltraMeter II

Go ahead, dunk it... The Environmental Industry has been waiting a long time for this meter. The UltraMeter 6P is completely waterproof to a depth of three feet. Now, basic field parameters of pH, Conductivity and Temperature can be acquired in a wet environment. Plus, you get three additional parameters of ORP, TDS, and Resistivity. With the ability to store up to 100 readings, this meter is designed for Groundwater Sampling.



Ultrameter 6PII

### NEW Datalogging & Downloading Capability

Cat. No.	Description	Price
MYR-UM-1	Ultrameter 6PII	\$1,145.50
MYR-UM-2	Ultrameter Field Kit	189.00

#### Field Kit Includes:

- Rugged all plastic foam lined case
- 2 oz. each pH Buffers 4, 7 & 10
- 2 oz. pH Sensor Storage Solution
- 2 oz. each 442-3000 & KCI-7000

**Tech Tip**  
This meter is rugged. Very few are sent in for repairs in 10 years of service.

## Water Quality Instrument Newsflash

EnviroTech has been a loyal Hanna Instruments distributor since 1990. In September of 2019, Hanna announced a sweeping policy whereby they were eliminating ALL distributors and they would be going to direct meaning if you want to purchase Hanna Instruments you must go to the Hanna website and pay list price. This left many users holding the bag, or "the instrument" in this case.

EnviroTech continues to offer technical service and repairs for Hanna Instruments, however, if you wish to purchase new Hanna products we recommend a better manufacturer in MyronL, YSI, Horiba or many other brands.

## NEW Oakton T-100 Field Turbidity Meter

The Oakton T-100 turbidity meter is easy to calibrate – meter automatically prompts you to the next calibration standard. Other features include auto-off, diagnostic error messages and auto-ranging function. Sealed optical system with infrared light source delivers high accuracy.



### Specifications

<b>Range</b>	0 to 19.99, 20.0 to 99.9; 100 to 1000 NTU	<b>Response Time</b>	less than 6 seconds
<b>Resolution</b>	0.01; 0.1; 1	<b>Display</b>	7 segment LCD
<b>Accuracy</b>	±2% of reading from 0 to 500 NTU; ±3% of reading 500 to 1000 NTU	<b>Light Source</b>	Infrared LED
<b>Sample Volume</b>	15 mL	<b>Operating Temp.</b>	0 to 50°C (32 to 122°F)
		<b>Power</b>	4 AAA Alkaline Batteries

Cat. No.	Description	Price
OAK-MM-35635-00	Oakton T-100 Waterproof Turbidity Meter	\$1,150.00
OAK-MM-35635-52	Replacement Calibration Set, Includes: one each of primary calibration standard cuvettes filled with 0.02, 20.0, 100, and 800 NTU	333.00
OAK-MM-35635-55	Cuvettes, pack of 3	48.00

## Solutions & Supplies



Cat. No.	Description	Price
BUFFERS		
ET-BP4	Buffer Solution; pH 4; 500 ml. bottle	\$18.00
ET-BP7	Buffer Solution; pH 7; 500 ml. bottle	18.00
ET-BP10	Buffer Solution; pH 10; 500 ml. bottle	18.00
ET-BPK	Buffer Kit; pH 4, 7, 10; 500 ml. bottles	55.00
ET-CS1413	Conductance Solution; 1413 µsm, 500 ml bottle Other Ranges Available; call for a quotation	18.00
CLEANING AGENTS		
FS-ALC-PKT	Alconox, Box of 50 1/2 oz. packets	95.00
FS-ALC-CTN	Alconox, 4-lbs carton	37.30
FS-LIQ-QT	Liquinox, 1 Quart Bottle	24.50
FS-LIQ-GL	Liquinox, 1 Gallon Bottle	72.60
GLOVES		
MIC-S-*	Blue Nitrile Gloves; Any Size	14.00
GLND-PF-*	Blue Nitrile Gloves Powder-Free, Any Size	19.00

## Presenting the U-50 Series Multi-Parameter Water Quality Meter

The Horiba U-50 Series replaces the long-standing U-10 series as a versatile multimeter capable of measuring 11 parameters, including turbidity.

- Easy to Read LCD Display
- All Parameters Listed on screen
- Text can be changed to larger Fonts
- Data Management Features
  - Direct download to PC
  - Diagnostic feature notifies user of errors
- Auto-Calibration features
- Cable can be disconnected

If you're wondering which meter is applicable to your project(s), review this chart.

■ U-5X series specification comparison list

	U-51	U-52	U-52G	U-53	U-53G
pH	●	●	●	●	●
ORP (Oxidation Reduction Potential)	●	●	●	●	●
Dissolved Oxygen	●	●	●	●	●
Conductivity	●	●	●	●	●
Salinity	●	●	●	●	●
TDS ( Total Dissolved Solids)	●	●	●	●	●
Seawater Specific Gravity	●	●	●	●	●
Temperature	●	●	●	●	●
Turbidity (LED)	—	●	—	—	—
Turbidity (Tungsten lamp)	—	—	—	●	●
Water depth	—	—	●	●	●
GPS	—	—	●	—	●



The U-52 is the most popular meter for groundwater well monitoring projects.

**RENTAL RATES**  
w/Controller  
**125/ 375/1125**  
DAY WEEK MONTH  
Also a Certified Repair Facility



**Rugged Outdoor Design**

In addition to groundwater sampling application, the U-50 has multiple other field applications.



Measurement in Marshes

**GPS Compatible**  
(U-52G/53G)



The system can be used in conjunction with the Global Positioning System (GPS) to record latitude, longitude, and other location data for individual measurements. This is particularly useful for environmental surveys.

Cat. No.	Cable Length	Model	Price
HOR-3200164509	U-51 2 m	U-51 (2 m)	\$3,345.00
HOR-3200164510	10 m	U-51 (10 m)	3,610.00
HOR-3200164501	2 m	U-52 (2 m)	3,750.00
HOR-3200164502	U-52 10 m	U-52 (10 m)	4,015.00
HOR-3200164503	30 m	U-52 (30 m)	4,548.00
HOR-3200156563	2 m	U-52G (2 m)	4,410.00
HOR-3200164499	U-52G 10 m	U-52G (10 m)	4,680.00
HOR-3200164500	30 m	U-52G (30 m)	5,210.00
HOR-3200164506	2 m	U-53 (2 m)	5,483.00
HOR-3200164507	U-53 10 m	U-53 (10 m)	5,750.00
HOR-3200164508	30 m	U-53 (30 m)	6,285.00
HOR-3200158178	2 m	U-53G (2 m)	6,150.00
HOR-3200164504	U-53G 10 m	U-53G (10 m)	6,415.00
HOR-3200164505	30 m	U-53G (30 m)	6,950.00

All units include sensors, calibration solutions, batteries, manual, and accessories.

OPTIONAL EQUIPMENT		
Cat. No.	Description	Pricing
HOR-5200524244	Hard Carry Case	\$400.00
HOR-3200156570	Flow Thru Cell	548.00
HOR-3200167002	Probe Guard	985.00
HOR-3200174823	Cable & Data Collection Software	125.00
HOR-362176	pH Sensor	75.00
HOR-300170923	TouPH pH Sensor	85.00
HOR-300170920	ORP Sensor	120.00
HOR-300170924	Dissolved Oxygen Sensor	390.00
HOR-362175	Reference Sensor	65.00
HOR-362173	Reference Sensor Cap / 2pk.	25.00
HOR-3200174430	4 liters pH4 solution (Auto-Cal)	160.00
HOR-3200156572	Calibration Beaker	40.00
HOR-3200170194	Replacement DO Membrane/Cap (3)	95.00

### Specifications

	U-51	U-52	U-52G	U-53	U-53G
<b>pH</b> • Two-point calibration • Automatic temperature	Measurement Principle: Glass electrode method Range: pH 0 to 14 Resolution: 0.01pH Repeatability: ±0.05pH Accuracy: ±0.1pH				
<b>Oxidation Reduction Potential (ORP)</b>	Measurement Principle: Platinum electrode method Range: -2000 mV to +2000 mV Resolution: 1 mV Repeatability: ±5 mV Accuracy: ±15 mV				
<b>Dissolved Oxygen (DO)</b> • Salinity conversion (0 to 70 PPT/automatic) • Automatic temperature compensation	Measurement Principle: Polarograph method Range: 0 to 50.0 mg/L Resolution: 0.01 mg/L Repeatability: ±0.1 mg/L Accuracy: 0 to 20 mg/L: ±0.2 mg/L, 20 to 50 mg/L: ±0.5 mg/L				
<b>Conductivity (COND)</b> • Auto range • Automatic temperature conversion (25°C)	Measurement Principle: 4 AC electrode method Range: 0 to 10 S/m (0 to 100 mS/cm) Resolution: 0.000 to 0.999 mS/cm: 0.001 1.00 to 9.99 mD/cm: 0.01 10.0 to 99.9 mS/cm: 0.1 0.0 to 99.9 mS/m: 0.1 0.100 to 0.999 S/m: 0.001 1.00 to 9.99 S/m: 0.01 Repeatability: ±0.05% F.S. Accuracy: (Median of two-point calibration)				
<b>Salinity</b>	Measurement Principle: Conductivity conversion Range: 0 to 70 PPT (permillage) Resolution: 0.1 PPT Repeatability: ±1 PPT Accuracy: ±3 PPT				
<b>Total Dissolved Solid (TDS)</b> • Conversion factor setting	Measurement Principle: Conductivity conversion Range: 0 to 100 g/L Resolution: 0.1% F.S. Repeatability: ±2 g/L Accuracy: ±5 g/L				
<b>Seawater Specific Gravity</b> • Display $\sigma_t$ , $\sigma_{\theta}$ , $\sigma_{15}$	Measurement Principle: Conductivity conversion Range: 0 to 50 $\sigma_t$ Resolution: 0.1 $\sigma_t$ Repeatability: ±2 $\sigma_t$ Accuracy: ±5 $\sigma_t$				
<b>Temperature</b>	Measurement Principle: Thermistor method Range: -5° to 55°C Resolution: 0.01°C Repeatability: ±0.10°C (at calibration point) Accuracy: JIS class B platinum thermometer sensor (±0.3 + 0.005)				
<b>Turbidity (TURB)</b>	Measurement Principle: LED light source and 90° scattering method Range: 0 to 800 NTU Resolution: 0.1 NTU Repeatability: ±5% (reading) or ±0.5 NTU whichever is greater Accuracy: ±5% (reading) or ±1 NTU whichever is greater				
<b>Water Depth</b>	Measurement Principle: Pressure method Range: 0 to 30m Resolution: 0.5m Repeatability: ±1% F.S. Accuracy: ±0.3m				



## MiniRAE 3000 Photoionization Detectors

Over the course of years, many reliable PID brands have vanished (i.e.: Photovac and Thermo 580B). RAE Systems has an active Research and Development department and they have virtually taken over the PID market with new innovative products. The Model 3000 is the new Standard PID model with upgraded features, ideal for most environmental applications.

Cat. No.	Description	List
RAE-059-B110-000	MiniRAE 3000	\$ 4,623.00
RAE-059-B111-100	MiniRAE 3000 KIT	5,591.00

- Accessories Kit Includes:**
- Hard transport case with pre-cut foam padding
  - Charging/download cradle
  - 5 Porous metal filters and O-rings
  - Organic vapor zeroing kit
  - Gas outlet port adapter and tubing



## QRAE 3

### Four-Gas Confined Space Gas Detector



The QRAE 3 is a full-featured, compact, two- to four-sensor confined space gas detector. The rechargeable Lithium-ion battery pack provides up to 20 hours of continuous operation. The QRAE 3 includes 16,000 datalogging points of storage capacity for download to any PC compatible with Windows 98, NT, 2000 and XP.

QRAE 3 is a versatile, rugged, one- to four-sensor pumped or diffusion gas monitor that provides continuous exposure monitoring of oxygen (O<sub>2</sub>), combustibles, and toxic gases, including hydrogen sulfide (H<sub>2</sub>S), carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>) and hydrogen cyanide (HCN), for workers and responders in hazardous environments.



### Sensor Specifications

Gas Monitor	Range	Resolution
Oxygen	0-30.0%	0.1%
Combustible	0-100% LEL	1% LEL
Carbon Monoxide	0-500 ppm	1 ppm
Hydrogen Sulfide	0-100 ppm	1 ppm
Sulfur Dioxide	0-20.0 ppm	0.1 ppm
Hydrogen Cyanide	0-100 ppm	1 ppm

Cat. No.	Description (Pumped Version Only Shown)	Price
	<b>QRAE 3 LEL / O<sub>2</sub> / H<sub>2</sub>S / CO Meter</b>	
M020-11111-111	Basic Unit with Accessories Kit (no gas or regulator)	\$ 1,046.00
M020-11111-112	Unit with Accessories and Calibration Kit	1,541.00
	<b>QRAE 3 LEL / O<sub>2</sub> / H<sub>2</sub>S / CO Meter Wireless</b>	
M020-11211-111	Basic Unit with Accessories Kit (no gas or regulator)	1,271.00
M020-11211-112	Unit with Accessories and Calibration Kit	1,766.00
	<b>QRAE 3 Confined Space Kits</b>	
CSK-1	Confined Space Kit for QRAE 3	248.00
CSK-2	Confined Space Kit for QRAE 3	743.00

# Remediation Products

## Passive Skimmers

The Keck PRC Skimmers will skim product off the surface of a groundwater well down to a sheen. Fill time is up to 15 minutes with quick discharge valve.



Cat. No.	Product	Price
<b>KECK PRC - Passive Recovery Canisters</b>		
86650307	PRC (2') - .125L Capacity	\$ 525.00
86650303	PRC (2') - .25 L Capacity	525.00
86650304	PRC (2") - .5 L Capacity	615.00
86650301	PRC (2') - 1 L Capacity	704.00
86650302	PRC (4") - 1 L Capacity	641.00
86650305	PRC (4") - 3 L Capacity	730.00
86650306	PRC (4") - 4 L Capacity	819.00

## SoakEase™

Absorbent socks inside a stainless steel canister for product absorption, removal and disposal from a groundwater well.



Models TB2-100 & TB4-100

Cat. No.	Description	Price
DUR-TB2-100	2 in. SoakEase™ Kit, contains: (1) 2 in. canister w/Absorbent Tube (15) Refill Absorbent Tubes	\$289.00
DUR-TB2-110	2 in. SoakEase™ Refill Case, (12) Absorbent Tubes	152.00
DUR-TB4-100	4 in. SoakEase™ Kit, contains: (1) 4 in. canister w/Absorbent Tube (4) Refill Absorbent Tubes	351.00
DUR-TB4-110	4 in. SoakEase™ Refill Case, (12) Absorbent Tubes	160.00
DUR-TB2-101	2 in. Canister Only	180.00
DUR-TB4-101	4 in. Canister Only	226.00



## Basic Sampling Kit

Shown is the basic soil sampling kit in a hard carry case. All the accessories are included. If you wish to save more dollars, a sampling kit with fewer items in a canvas case is available. Call for prices.

Cat. No.	Description	Price
<b>5/8" Threaded</b>		
AMS-209.53	2 1/4" Basic Soil Sampling Kit	\$ 1,478.50
AMS-209.51	3 1/4" Basic Soil Sampling Kit	1,435.70

## ESS Core N' One™

*The easiest way to sample and transport 5 grams of undisturbed soil samples for US EPA Method 5035.*

Enviro-Tech offers the Lock and Load soil sampling device from ESS. This method is approved by the EPA and is much cheaper than the Encore method.



Use for both soil collection and transportation.

Cat. No.	Description	Price
<b>Core N' One</b>		
ESS-19082	Core N' One Soil Handle	\$ 13.50
ESS-19083	Core N' One Soil Capsule (20)	160.00

## Munsell Soil Color Chart Binder

The Munsell color chart is a staple for soil sampling and Geologic classification. As a stocking distributor, we sell for less.



Cat. No.	Description	Weight	Price
<b>Munsell Soil Color Chart Binder</b>			
AMS-504.00	Munsell Soil Binder w/Chart	0.80 lb	\$ 218.00

## Soil Liners



Standard Dimensions	Cat. No.	Stainless
1.5"x3"	VB-SL153	\$ 2.25
1.5"x6"	VB-SL156	2.80
2"x3"	VB-SL23	3.00
2"x4"	VB-SL24	3.50
2"x6"	VB-SL26	3.90
2.5"x3"	VB-SL253	3.70
2.5"x6"	VB-SL256	5.05

Cat. No.	Description	Price
VB-EC	Plastic End Caps (1", 1.5", 2", 2.5")	\$ .22
VB-TT4	Roll Teflon Tape 4" x 100' Regular	60.00
VB-PTT4	Roll Teflon Tape 4" x 100' Perforated	75.00
VB-STD1	Adhesiveless (Silicon) Tape	26.00
VB-T54	4x4 Teflon Squares 100/pk.	35.00

## Plastic Disposable Scoops

For fast solid collection using disposable scoops we provide these units, or we have dippers for use in collecting surface water samples.



Description	Standard Scoops		Prcleaned Scoops		
	Capacity	Case Pack	Item	Case Price	
4 oz.	25	CON-8504-25	34.15	CON-8504-25C	40.75
		CON-8504-50	64.35	CON-8504-50C	77.40
6 oz.	25	CON-8506-25	36.75	CON-8506-25C	43.75
		CON-8506-50	73.50	CON-8506-50C	83.80

## Soil Core Sampling Mini Kits

*Everything you need for augering to 12'!  
(Includes Core Sampler.)*

AMS soil core sampling kits provide all the components needed to auger up to 12' and then collect a virtually undisturbed soil core sample in a liner. Available in 3-1/4", in either carbon steel or all stainless steel with 5/8" threaded connections.

**Includes:** Regular auger, four 3' extensions, cross handle, core sampler, slide hammer, 2 plastic end caps, liner, 2 wrenches, universal slip wrench and poly-canvas case.

### Soil Core Sampler (SCS)



Cat. No.	Description	Weight	List Price
<b>5/8" Threaded, Regular (not Stainless Steel)</b>			
AMS-209.07	3 1/4" Soil Core Sampling Mini Kit	32.50 lb	\$ 1,033.00
<b>Threaded Replacement Parts</b>			
AMS-400.06	3 1/4" Regular Auger	2.56 lb	147.00
AMS-404.05	2" x 6" SCS Complete	13.08 lb	378.30
AMS-408.02	5/8" x 3' Extension	1.66 lb	61.20
AMS-406.04	16" Rubber-Coated Cross Handle	1.04 lb	41.10
AMS-421.29	Universal Slip Wrench	1.24 lb	38.10
AMS-421.10	Wrench	1.70 lb	36.10
AMS-430.00	3' Poly-Canvas Case	2.50 lb	105.20
<b>5/8" Threaded, Stainless Steel</b>			
AMS-209.05	3 1/4" SST Soil Core Sampling Mini Kit	32.50 lb	\$ 1,457.20
<b>Stainless Steel Replacement Parts</b>			
AMS-417.06	3 1/4" SST Regular Auger	2.52 lb	239.00
AMS-404.63	2" x 6" SST SCS Complete	13.08 lb	448.50
AMS-400.99	Slide Hammer	10.22 lb	179.10
AMS-409.08	5/8" x 3' SST Extension	1.66 lb	90.20
AMS-409.11	16" SST Cross Handle	1.04 lb	—
AMS-421.29	Universal Slip Wrench	1.24 lb	38.10
AMS-421.10	Wrench	1.70 lb	36.10
AMS-430.00	3' Poly-Canvas Case	2.50 lb	105.20



Purchase Online with  
P.O. or Project Number

## MiniRAE Lite

Environmental Applications Monitor without datalogging features and has a lower detection range



The MiniRAE Lite is excellent for environmental sampling and is over \$1,000 less than the MiniRAE 3000. The differences are simple. Range is reduced to 5,000 ppm and it does NOT datalog. Also, the easy-to-use replaceable alkaline battery source provides instant use in the field—no more worries about recharging.

**RENTAL RATES**  
**75 / 200 / 725**  
DAY WEEK MONTH  
Also a Certified Repair Facility

### Key Features

- 4th Generation PID Meter
- Designed for Environmental Applications
- Easier to use
- Lower Cost
- Professional

### Tech Tip

The Photoionization Detector is used for screening soil samples for Volatile Organic Compounds. It is commonly used to delineate soil contaminated areas from clean soil areas and for selecting what soil samples will be analyzed for VOCs. It is also used to screen drilling fluids or auger cuttings for the presence of VOC compounds.



Cat. No.	Description	Price
RAE-059-A110-0000	MiniRAE Lite	\$ 3,112.00
RAE-059-A110-1000	MiniRAE Lite KIT	3,720.00

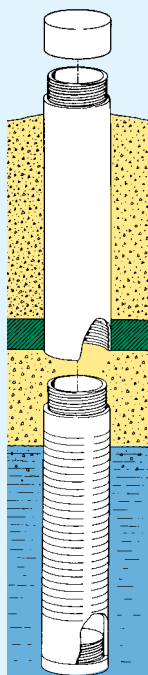
### Complete Kit includes:

Hard carry case, monitor, lamp, cleaning kit, 5 filters, gas outlet post & tubing, calibration gas, flow controlled regulator.

Alkaline battery power source or rechargeable Li-ion battery.

## PVC Well Casing and Screen

### Price List



**Flush Threaded:** All casing and screen products conform to the accepted ASTM-F480 standard requirements, unless alternate specifications are requested. To ensure maximum QA/QC, each casing and screen product is individually packaged in durable moisture resistant and wax coated corrugated shipping containers. Each piece is also individually environmentally wrapped and cleaned.

Cat. No.	Dimensions	Schedule 40		Box Quantities
		Flush Thread	List Price	
MON-C225	2-inch x 2.5-foot	Casing	\$ 17.59 ea.	6
MON-C25	2 inch x 5 foot	Casing	23.39 ea.	6
MON-C210	2 inch x 10-foot	Casing	43.19 ea.	6
MON-S225	2-inch x 2.5-foot	Screen	32.24 ea.	6
MON-S25	2 inch x 5-foot	Screen	42.99 ea.	6
MON-S210	2-inch x 10-foot	Screen	50.96 ea.	6
MON-C425	4-inch x 2.5 foot	Casing	\$ 46.06 ea.	2
MON-C45	4-inch x 5-foot	Casing	62.08 ea.	2
MON-C410	4-inch x 10 foot	Casing	98.50 ea.	2
MON-S425	4-inch x 2.5-foot	Screen	64.72 ea.	2
MON-S45	4-inch x 5 foot	Screen	113.02 ea.	2
MON-S410	4-inch x 10 foot	Screen	127.29 ea.	2

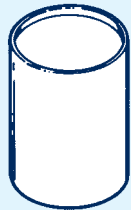
- All Orders are for boxed quantities or add 15%
- U-Pak Screens and Petroleum Observation Wells also available
- 6-inch through 12-inch also available, phone toll-free for pricing

## PVC Fittings and Accessories

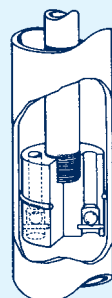
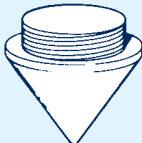
Flush Thread End Plug



Flush Thread End Caps



Flush Thread Solid Point



TIMCO™ Surge Block  
PVC 1 1/2", 2", 4", and 6"

## Surge Blocks for Well Development

The MonoFlex surge block is used to develop a well by allowing a gentle flow of water through the screen. This action sets the gravel pack thus providing maximum water flow. To be used in 1 1/2", 2", 4" and 6" Schedule 40 PVC Regular or High Flow Screens.

Cat. No.	Size	Description	Price
MON-2SC	2-inch	Slip Cap	\$ 3.00
MON-2TECM	2-inch	Threaded End Cap (Female)	11.77
MON-2TECF	2-inch	Threaded End Cap (Male)	11.77
MON-2WP	2-inch	Well Point	15.62
MON-2HP	2-inch	Hoisting/Lifting Plug	58.00
MON-4SC	4-inch	Slip Cap	9.22
MON-4TECF	4-inch	Threaded End Cap (Female)	22.00
MON-4TECM	4-inch	Threaded End Cap (Male)	22.00
MON-4WP	4-inch	Well Point	28.00
MON-4HP	4-inch	Hoisting/Lifting Plug	165.00

6-inch through 12-inch also available

Surge Block Size	Cat. No.	Surge Block Price
2" w/3/4" thread	MON-SB2	\$ 133.50
4" w/1" thread	MON-SB4	150.00
6" w/1 1/4" thread	MON-SB6	321.00

Surge Blocks may be provided with NPT on request. Brass and Leather Surge Blocks also available.

## Well Protection/Below Grade



Enviro-Tech carries a wide variety of flush mounted below grade well protection equipment. The top seller is the **Morrison** well cover. This design offers water tight gaskets and a dual bolt access design, plus each clearly displays MONITORING WELL on the lid.

Cat. No.	Description	Price
<b>Morrison Well Covers</b>		
MOR-418XA-88	Standard 8-inch x 8-inch skirt	\$ 74.50
MOR-418XA-812	Standard 8-inch x 12-inch skirt	76.00
MOR-418XA-1212	Standard 12-inch x 12-inch skirt	112.00

**Hazardous Labels Available Also**

## Non-Hazardous Labels

Non-Hazardous Waste labels of various types are available. Here is the most popular.



Cat. No.	Description	Price
BRE-NHZL	Non-Hazardous Waste Labels	\$ 36.00

## Caution Tape



Cat. No.	Description/Size	Price
BB-OCT	Roll Orange Caution Tape; 3' x 1000'	\$18.00
BB-RDT	Roll Red Danger Tape; 3' x 1000'	18.00

## Well Plugs

Enviro-Tech carries a variety of well plugs and caps. Here is our latest sale on one popular brand.



Cat. No.	Description	Price
CHR-271-675	2" Well Plug	\$18.00
CHR-271-683	4" Well Plug	21.10
CHR-271-691	6" Well Plug	42.40

## Locks

Master Steel Lock



Dolphin Lock



- Laminated Steel Body
- Precision Pin-Tumbler Mechanism
- Available Keyed Alike

- Keyed Alike

Cat. No.	Brand	Style/Size	Price
MAS-1	Master	#1	\$14.25
MAS-3	Master	#3	14.25
AME-30	American	#30	14.45
CHR-112-941	Dolphin	#1600	5.80

## 2" & 4" FlushLock Well Plugs

### A new brand of Locking Well Plugs

Our new low cost high-tech FlushLock well plugs are flush in height and diameter with the well casing freeing up space in pro casings or manholes. Made from an environmentally sustainable prime Nylon.



Cat.	Description	Price
FL2	2" FlushLock	\$16.00
FL4	2" FlushLock	24.50
FLK	Key	10.00

## Blue Nitrile Gloves

As a stocking distributor we carry a variety of gloves. Here are the most popular for the environmental industry.



Catalog No.	Description	Size	Unit	Price
GLND-PF-XL	Supreno SE Powder-Free Nitrile	XL	50 pr/box	\$19.00
GLND-PF-L	Supreno SE Powder-Free Nitrile	L	50 pr/box	19.00
GLND-PF-M	Supreno SE Powder-Free Nitrile	M	50 pr/box	19.00
GLND-PF-S	Supreno SE Powder-Free Nitrile	S	50 pr/box	19.00

Catalog No.	Description	Size	Unit	Price
FS11-18-999-4410	Atlas Fit Rubber-Coated	S	12 pr/pack	\$45.00
FS11-18-999-4410A	Atlas Fit Rubber-Coated	M	12 pr/pack	45.00
FS11-18-999-4410B	Atlas Fit Rubber-Coated	L	12 pr/pack	45.00
FS11-18-999-4410C	Atlas Fit Rubber-Coated	XL	12 pr/pack	45.00

## Tyvek®

Enviro-Tech stocks a variety of tyvek suits at a price no competitor can beat. 25/bx.



Available with or without elastic wrist & ankle.

Cat. No.	Size	Price
50060	S	\$184.00
50061	M	184.00
50062	L	184.00
50063	XL	184.00
50064	2XL	195.00
50065	3XL	206.75
50066	4XL	223.25

ITEM / DESCRIPTION	Brand	Daily	Weekly	Monthly
<b>GROUNDWATER SAMPLING INSTRUMENTATION</b>				
<b>Water Level Meters</b>				
Water Level Meters: 100'-300'	Solinst /Heron	40.00	105.00	315.00
Water Level Meters: 500'-1000'	Solinst /Heron	45.00	135.00	395.00
Sonic Depth Meter, uses acoustic waves	Sonic	50.00	150.00	450.00
TLC (Temp/Level/EC) Meter	Solinst /Heron	60.00	180.00	540.00
<b>Oil/Water Interface Meters</b>				
Solinst, Heron, Slope				
Oil Water Interface Meters 100'-300'	Solinst /Heron	85.00	255.00	765.00
Oil Water Interface Meter 500'	Solinst /Heron	95.00	285.00	855.00
<b>Single Parameters Instruments</b>				
<b>Dissolved Oxygen</b>				
Standard Dissolved Oxygen Meter	YSI	55.00	165.00	495.00
YSI Pro DO Optical DO; Dissolved Oxygen (optical)	YSI	70.00	210.00	630.00
<b>Turbidity</b>				
Turbidity Meters	Hanna, Geotech, Oakton	50.00	150.00	450.00
<b>Multi Parameter Instruments</b>				
Multi-Meter 2m / 10m cable	Horiba U-10	80.00	240.00	720.00
pH / Temp / EC / ORP / DO /Turb /TDS				
Multi-Meter 2m / 10m cable w/ Flow Cell	Horiba U-52	145.00	435.00	1305.00
pH / Temp / EC / ORP / DO /Turb /TDS / Salinity				
Multi-Meter 4m / 10m / 20m cable w/ Flow Cell	YSI 556	110.00	330.00	990.00
pH / Temp / EC / ORP / DO /Turb /TDS				
UltraMeter II 6P (pH / Cond / Temp / ORP / Resistivity)	MyronL	45.00	135.00	405.00
<b>Dataloggers</b>				
Solinst Levellogger System (Direct Read System Available)	Solinst	60.00	180.00	560.00
*priced per logger				
<b>GROUNDWATER SAMPLING PUMPS AND EQUIPMENT</b>				
Proactive Purge Pump w/Controller: 40'-85'	Proactive	55.00	165.00	495.00
Proactive Purge Pump w/Controller: 90'-150'	Proactive	75.00	225.00	675.00
Proactive Purge Pump w/Controller: 200'	Proactive	95.00	285.00	855.00
Grundfos RediFlo2 System	Proactive	95.00	285.00	855.00
Grundfos RediFlo2 Controller 115V / 230V	Proactive	95.00	285.00	855.00
<b>Low Flow Sampling</b>				
GeoPRO Bladder Pump System (.5"/1.6" dia.)	Geotech	180.00	540.00	1620.00
QED Sample Pro System: MP10, 1.6" pump	QED	180.00	540.00	1620.00
Waterra Hydrolift 2 Inertial Pump (ideal for Well Development)	Waterra	110.00	330.00	990.00
*HDPE/LDPE Tubing Required w/ Footvalve				
Peristaltic Pump AC/DC	Geotech	40.00	160.00	480.00
<b>AIR MONITORING (HEALTH AND SAFETY) EQUIPMENT</b>				
<b>Single Gas Parameter Instruments</b>				
MiniRAE 2000/3000 PID, 10.6eV lamp	Rae Systems	100.00	300.00	900.00
ppbRAE, 10.6eV lamp	Rae Systems	160.00	480.00	1440.00
Calibration Kit: 100ppm Iso, Regulator & Tubing		30.00	90.00	180.00
*Price based on 25% gas usage per week. Overages billed accordingly.				
ION Science GE Helium Detector	ION Science	140.00	420.00	1260.00
<b>Multiple Gas Parameter Instruments</b>				
MultiRAE: PID & 4 gas	Rae Systems	105.00	315.00	945.00
QRAE: 4-gas Meter (LEL/O2/H2S/CO)	Rae Systems	90.00	270.00	810.00
RKI GX-2012: (LEL/O2/H2S/CO/PID)	RKI	75.00	225.00	675.00
RKI Eagle 2: (LEL/O2/H2S/CO/PID)	RKI	105.00	315.00	945.00
Calibration Kit: 100ppm Iso, 4-gas mix, Regulator & Tubing		30.00	90.00	180.00
*Price based on 25% gas usage per week. Overages billed accordingly.				
<b>Landfill, Particulate, Mercury Monitors, and Air Sampling</b>				
Methane Monitor GEM 2000+: CH4/O2/LEL/Temp	Landtec	170.00	510.00	1530.00
Methane Landfill Monitor	RKI	130.00	390.00	1170.00
RKI Gas Tracer: LEL/O2/CO	RKI	65.00	195.00	585.00
Thermo DataRAM PDR-1000: Personal Particulate Monitor	Thermo	110.00	330.00	990.00
Jerome 431X Mercury Vapor Analyzer	Jerome	105.00	480.00	1400.00
GilAir 5 Sampling Pump or GilAir Plus	GilAir	30.00	150.00	450.00
<b>SOIL SAMPLING, PIPELINE AND MISC. EQUIPMENT</b>				
AMS Hand Auger w/ 3' extension & t-handle, 3.25" stainless steel	AMS	40.00	120.00	360.00
AMS Complete Basic Soil Sampling Kit: 3.25"	AMS	95.00	285.00	855.00
AMS Flighted Auger Kit w/ Hammer Drill	AMS	170.00	510.00	1530.00
Flowmeter: Global Water FP101: 3' to 6' extendable	Global	40.00	120.00	360.00
Anemometer: Veloci-Calc 9545A	TSI	60.00	180.00	540.00
Rotary Hammer Drill: Bosch/Dewalt)	AMS	60.00	180.00	540.00
Honda EU2000 Generator (2000w)	Honda	70.00	210.00	630.00
GVP Kit: Soil Vapor (Vadose Zone Sampling)	AMS	220.00	660.00	1980.00
*w/ Removal Jack & Hammer Drill				

# Equipment Rental Rates



Solinst 101  
Water Level Meter

**RENTAL RATES**  
**40/105/315**  
**DAY WEEK MONTH**  
Also a Certified  
Repair Facility



UltraMeter 6P

**RENTAL RATES**  
**45/135/405**  
**DAY WEEK MONTH**  
Also a Certified  
Repair Facility



YSI 556

**RENTAL RATES**  
**110/330/990**  
**DAY WEEK MONTH**  
Also a Certified  
Repair Facility



Solinst 121  
Interface Meter

**RENTAL RATES**  
**86/255/765**  
**DAY WEEK MONTH**  
Also a Certified  
Repair Facility



Solinst Levellogger

**RENTAL RATES**  
**60/180/560**  
**DAY WEEK MONTH**  
Also a Certified  
Repair Facility



Horiba  
U-50 Series

**RENTAL RATES**  
**145/435/1305**  
**DAY WEEK MONTH**  
Also a Certified  
Repair Facility



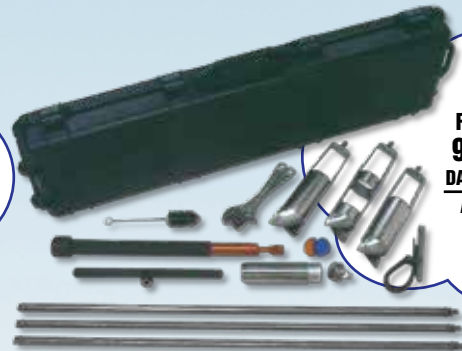
Grundfos RediFlo2  
w/Controller

**RENTAL RATES**  
w/Controller  
**200/600/1800**  
**DAY WEEK MONTH**  
Also a Certified  
Repair Facility



RAE Systems  
MiniRAE 2000 PID

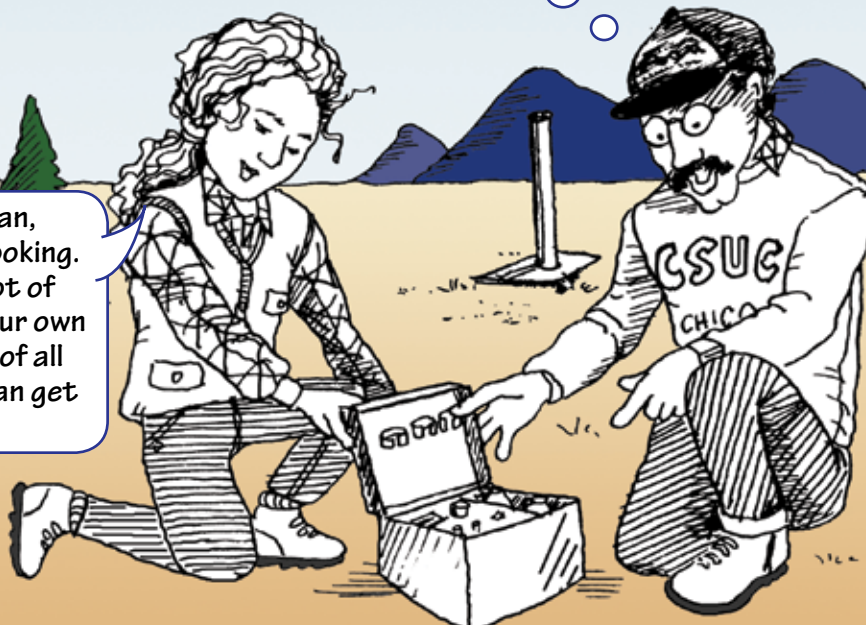
**RENTAL RATES**  
**100/300/900**  
**DAY WEEK MONTH**  
Also a Certified  
Repair Facility



AMS Basic Soil Sampling Kit

**RENTAL RATES**  
**95/285/855**  
**DAY WEEK MONTH**  
Also a Certified  
Repair Facility

Wow!, this rental is clean,  
calibrated and sharp looking.  
By renting, we save a lot of  
time not maintaining our own  
equipment. Just think of all  
the other rentals we can get  
from Enviro-Tech.





4851 Sunrise Dr., #101  
 Martinez, CA 94553  
 1-800-468-8921



Purchase Online with  
 P.O. or Project Number

## Technical Field Guide & Mini Catalog

This Field Guide is provided as a useful “tool” for field personnel working in the Environmental Industry. The Guide contains useful publications, charts, graphs and information used in the acquisition of data during field protocols for drilling, well logging, well completion, and groundwater sampling and monitoring projects. Again, the intent of the Guide is to provide a useful “tool” for field personnel. Enviro-Tech assumes no responsibility or liability for, or resulting from, the information contained in the Field Guide.

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Measurement Conversion Data .....	8
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Field Charts & Field Tools.....	10-11



**If you received this catalog, your Company/Agency has an account.**