

**COMMON* ANALYTICAL AND PREPARATION METHODS
CONSUMERS ENERGY COMPANY
CHEMISTRY LABORATORY**

January 28, 2003

PARAMETER	MATRIX	METHOD
UST, CONTAMINATED SITE ANALYSIS		
BTEX	soil/water	8021/8260
add MTBE	soil/water	8021/8260
add Trimethylbenzenes	soil/water	8021/8260
add Naphthalene, 2-Methylnaphthalene	soil/water	8021/8260
* see Method 5035 requirements		
MI-UST-VOCs (BTEX,MTBE,TMBs,Nap,2MeNap,DBE,DCE)	soil/water	8260
* see Method 5035 requirements		
Halogenated VOCs, 601 List	soil/water	8021
* see Method 5035 requirements		
VOCs - Michigan Extended List	soil/water	8260
* see Method 5035 requirements		
SVOCs - PAHs only	soil/water	8270
SVOCs - b/n	soil/water	8270
SVOCs - b/n/a	soil/water	8270
PCBs	soil	8082/8080
PCBs	water	8082/8080
PCBs	sludge	8082/8080
Pesticides - organochlorine - 608 List	soil/water	8081
Pesticides - others	call	8081
* call for Target Compound List		
Herbicides - chlorinated - 615 List	soil/water	8151
Herbicides - others	call	8151
* call for Target Compound List		
Chlorinated Hydrocarbons - 612 List	soil/water	8121
Chlorinated Hydrocarbons - others	call	8121
* call for Target Compound List		
Total Petroleum Hydrocarbons - TPH	soil/water	418.1
Gasoline Range Organics GRO	soil/water	UST
Diesel Range Organics DRO	soil/water	UST
* GRO and DRO by EPA-UST Workgroup or MI-Modified 8015		
* see Method 5035 requirements		

PARAMETER	MATRIX	METHOD
UST, CONTAMINATED SITE ANALYSIS cont.		
Non-Halogenated Solvents	soil/water	8015
Non-Halogenated Solvents	soil/water	8260
* call for Target Compound List		
* see Method 5035 requirements		
Glycols - Ethylene and Propylene Glycols	soil/water	8015
Product ID - Hydrocarbon Distribution	soil/water	ASTM
Lead	soil/water	a/b/c/d

Lead, Cadmium, Chromium	soil/water	a/b/c/d
MI-10 Metals	soil/water	a/b/c/d
Non-MI-10 Metals, each	soil/water	a/b/c/d
Chromium, Hexavalent	soil	3060A**/7195
Chromium, Hexavalent	water	7195
Mercury	water	7470A/245.1
Cyanide, Total and Amenable	Soil	9013/9010
Cyanide, Total and Amenable	water	9010
Cyanide, Available*	Soil	OIA-1677
Cyanide, Available*	water	OIA-1677
Cyanide, Free	Soil	D-4282
Cyanide, Free	water	D-4282

* Method OIA-1617 provided after September, 1999. Waters require a special sample kit.

TCLP or SPLP - Metals (plus parameter cost)	Soil	1311 or 1312
TCLP or SPLP - ZHE (plus parameter cost)	Soil	1311 or 1312
TCLP or SPLP - SVOCs (plus parameter cost)	Soil	1311 or 1312

Method 5035 Sampling Kits, Methanol Preservation

- Encore Kit	Soil	5035
- Syringe Kit	Soil	5035

Samples for metal analysis are prepared according to the SW-846 Methods 3005-3051

** Alkaline Digestion for Hexavalent Chromium in Soils

a – 7000 Series, Atomic Absorption Methods, SW-846

b – 200 Series, EPA Methods for Chemical Analysis of Water and Wastes, including 200.7 and 200.8 where applicable

c – SW-846, Method 6010

d- SW-846, Method 6020

UST OR CONTAMINATED SITE - VAPOR ANALYSIS

BTEX, MTBE and GRO	Vapor	modified 8021/8015
Benzene only	Vapor	
Volatile aromatics	Vapor	
Site sampling and air monitoring	Vapor	

* call for appropriate sampling protocol

TRANSFORMER ANALYSIS, Mineral Oil Only

PARAMETER	MATRIX	METHOD
Dissolved Fault Gas	Oil	D-3612
Moisture	Oil	D-1533-B
Acidity	Oil	D-974
IFT	Oil	D-971
Color	Oil	D-1500
Specific Gravity	Oil	D-1298
kV Breakdown - Flatplate	Oil	D-877
kV Breakdown - Spherical	Oil	D-1816
Power Factor	Oil	D-924
Oxidation Inhibitors, DBP and DBPC	Oil	D2688
PCBs	Oil	D-4059

NATURAL GAS ANALYSIS

Natural Gas Analysis, with C6-Plus Backflush	Gas	ASTM
Natural Gas Analysis, with C6-C12 Breakdown	Gas	SW 846 Chpt 7

HAZARDOUS WASTE ANALYSIS

Flash Point	Waste	1010
Reactivity	Waste	
Cyanide	Waste	9014
Sulfide	Waste	9034
Cyanide and Sulfide	Waste	9014/9034

Corrosivity	Waste	
pH	Waste	9040
RCRA - Volatile Organic Compounds, TCLP	Waste	1311/8260
RCRA - Semivolatile Organic Compounds, TCLP	Waste	1311/8270
RCRA - Base/Neutral Extractables, TCLP	Waste	1311/8270
RCRA - Acid Extractables, TCLP	Waste	1311/8270
RCRA - Base/Neutral and Acid Extractables, TCLP	Waste	1311/8270
RCRA - Pesticides and herbicides, TCLP	Waste	1311
RCRA - 8 Metals, TCLP	Waste	see below
RCRA Characterization Suite*	Waste	SW-846 Chpts 7 & 8
* Flash point, pH, Cn-, S-, VOC, SVOC, pesticides, herbicides, metals		
TCLP - Metals Preparation Only	Waste	1311
Total Halogens	Waste	9020
UHC Analysis – VOC, SVOC, alcohol	Waste	8260/8271/8015
Paint Filter	Waste	9095
PCB	Waste	8280/8080
Onsite Sampling	Waste	--

PARAMETER	MATRIX*	METHOD
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PARAMETER	MATRIX*	METHOD
Aluminum	soil/water	a/b/c/d
Antimony	soil/water	a/b/c/d
Arsenic	soil/water	a/b/c/d
Barium	soil/water	a/b/c/d
Beryllium	soil/water	a/b/c/d
Bismuth	soil/water	6010/6020
Boron	soil/water	6010/6020
Cadmium	soil/water	a/b/c/d
Calcium	soil/water	a/b/c/d
Chromium	soil/water	a/b/c/d
Chromium, Hexavalent	soil	3060A**/7195
Chromium, Hexavalent	water	7195
Cobalt	soil/water	a/b/c/d
Copper	soil/water	a/b/c/d
Iron	soil/water	a/b/c/d
Lead	soil/water	a/b/c/d
Lithium	soil/water	7430/6010/6020
Magnesium	soil/water	a/b/c/d
Manganese	soil/water	a/b/c/d
Mercury	soil/water	245.1/7470A/7471A
Molybdenum	soil/water	a/b/c/d
Nickel	soil/water	a/b/c/d
Phosphorous	soil/water	6010
Potassium	soil/water	a/b/c/d
Selenium	soil/water	a/b/c/d
Silicon	soil/water	200.7/6010
Silver	soil/water	a/b/c/d
Sodium	soil/water	a/b/c/d
Strontium	soil/water	a/b/c/d
Sulfur	soil/water	6010
Thallium	soil/water	a/b/c/d
Tin	soil/water	a/b/c/d
Titanium	soil/water	a/b/c/d
Vanadium	soil/water	a/b/c/d
Zinc	soil/water	a/b/c/d
Other metals are also available	soil/water	a/b/c/d

* Samples are prepared according to the SW-846 Methods 3005-3051

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OTHER INORGANIC PARAMETERS		
PARAMETER	MATRIX	METHOD
Alkalinity, Total	water	310.1
Biochemical Oxygen Demand	water	405.1
Bromide	water	300.0
Chemical Oxygen Demand	water	410.2
Chloride	water	325.3/300.0
Coliform, Fecal	water	SM 9222D
Conductivity	water	120.1
Dissolved Oxygen	water	360.1
Fluoride	water	340.2/300.0
Hardness, Total	water	130.2
Nitrogen, Nitrate	water	353.3/353.2/300.0
Nitrogen, Nitrite	water	353.3/353.2/300.0
Nitrogen, Ammonia	water	350.3/350.1
Nitrogen, Total Kjeldahl (TKN)	water	351.4
Oil and Grease	water	413.1
pH	water	150.1
Total Suspended Solids (TSS)	water	160.2
Total Dissolved Solids (TDS)	water	160.1
Sulfate	water	375.4/300.0
Sulfite	water	-
Ortho Phosphate (as P)	water	300.0
Phosphorus, Total	water	365.2
Total Organic Carbon	water	415.1

INDUSTRIAL HYGIENE		
PARAMETER	MATRIX	METHOD
Asbestos Identification (PLM)	bulk, varies	EPA-600
Asbestos Fiber Count (PCM)	MCE Filters	OSHA ID-160
Building Inspection (Asbestos and Lead Paint)		
Mercury in Air Sampling (ppt level analysis)		

Other analytical methods or preparation methods may be substituted for these listed here if metric effects, analytical detection limits or other factors dictate. In all cases, the Lab will identify the test methods and preparation methods used for the analysis.

Pricing available on request

Laboratory Services offers four levels of documentation to meet QA/QC requirements:

Level 1: Analytical results as well as method detection limits (MDLs), date of analysis, analyst information, and pertinent client and sample information.

Level 2: Analytical results and limited QC data summaries (blank results, laboratory control sample results, spiked samples and spike duplicate results and surrogate sample recoveries). The Lab's standard data package applies to this level of QA/QC reporting.

Level 3: Provides QC and Calibration data summaries for specific client or project-related sample runs. The QC package will also include chromatograms, but will not include raw data and spectra. Laboratory Services offers this service at a standard 25% mark-up. Client's samples will be run as a discrete batch rather than co-mingled with samples from other clients. Project or site specific MS/MSD is charged separately.

Level 4: Laboratory Services will furnish QC and calibration summaries (Level Three) along with hard copy or raw analytical data for sample and QA runs. Samples will be scheduled as in Level Three QC. LCS will surcharge 40% for Level 4 documentation. Project or site specific MS/MSD is charged separately.