The Northwest Environmental Training Center presents:

Contaminant Forensics of Petroleum, Chlorinated Hydrocarbons, and Metals - Geochemical Applications for Assessing Contaminant Transport, Risk, and Apportioning Liability

Course ID: CHEM-405
August 12-13, 2008, 8:30 A.M. to 5 P.M. (2 Days)
Lacey Community Center
Located in the Woodland Creek Community Park
6729 Pacific Ave SE
Lacey, Washington 98503
360.491.0857

Instructors: *Richard W. Hurst, Ph.D.*

Description: This course provides participants with an overview and introduction to forensic geochemical techniques that can resolve issues related to contaminant transport and associated risks. The course provides the fundamentals of forensic science, and addresses how forensic results have been used to identify parties responsible for a contaminant release, and apportion liability for cleanup/recovery costs. The course is intended for environmental, geotechnical, engineering, and regulatory professionals seeking an improved understanding of contaminated soil and groundwater.

Course Topics

(times are approximate - class exercises and breaks are not shown)

Day 1: Tuesday, March 11, 2008, 8:30 A.M. - 5 P.M.	Day 2: Wednesday, March 12, 2008, 8:30 A.M. - 5 P.M.
8:30 - 9:30 A.M. - Introduction and Review of the Basics - General Chemical Nomenclature - Contaminants and Partitioning - Isotope Chemistry - Data Presentation **9:30 - 11 A.M. - Forensic Geochemistry** - Definitions - Benefits - Overview of Techniques and Applications (direct, indirect, and surrogate tracers) **11 A.M. - Noon - High Resolution Gas Chromatography** - Review of High Priority Organic Contaminants - Standard EP-Type Chromatograms - High Resolution GC (HRGC) Fingerprinting **Noon - 1 P.M. - Lunch** **1:30 P.M. - 4 P.M. Environmental Isotopes** - Mass Spectrometry (IRMS v. CSIRMS) - Stable Isotopes: C, H, O, N, S, Cl - Stable Radiogenic Isotopes: Sr and Pb - Cosmogenic Isotopes	**8:30 - 11 A.M. - Hydrocarbon Contamination Continued** - Estimating the Age of Releases (Additives, Compositional Changes, Degradation, ALAS Model) - Chlorinated Hydrocarbons (PCE, TCE, DCE, and VC) **11 A.M. - Noon - Groundwater Contamination** - Saline Water Intrusion - Nitrates **Noon - 1 P.M. - Lunch** **1 P.M. - 3 P.M. - Groundwater Contamination (cont.)** - Sewage - Perchlorates **3 - 4:30 P.M. - Heavy Metals and Metalloids in the Environment** - Overview of Heavy Metals - Lead - Arsenic - Chromium and Others **4:30 - 5 P.M. Wrap Up and FAQs** - Instructor-Student Open Discourse

4 - 5 P.M. - Hydrocarbon Contamination Forensics - Correlating Releases to their Source - HRGC and Isotopic Approaches	**5 P.M. Closing**

Class will begin each day at 8:30 A.M. and end at 5 P.M. Attendees will be given the opportunity to apply course concepts during numerous hands-on exercises.

About the Instructor:

Richard W. Hurst received his Doctorate in Geology and Geochemistry from the University of California, Los Angeles in 1975. He joined the faculty of the Department of Geological Sciences, California State University, Los Angeles in 1978. His research efforts concentrated on the practical application of naturally occurring stable isotopes as tracers for contaminants in the environment. By 1980, he began consulting in forensic geochemistry, providing services to a diverse clientele in the private sector. His expertise in forensic isotope geochemistry, environmental forensics, and mineralogy is well known and respected in the academic, geotechnical, and legal communities. He is recognized for the development of the ALAS Model, a geochemical technique for estimating the age of gasoline releases, and for his exceptional ability to distill complex geological/geochemical data into a language that can be understood by non-technical professionals and students. He has developed university courses in forensic/environmental geochemistry and is currently writing a volume entitled Forensic Isotope Geochemistry for Elsevier Publishers.

After completing this course, participants will be able to:

- Identify methods available to resolve complex cases, such as those involving long term and/or multiple releases of contaminants
- Utilize soil and groundwater geochemical analyses to assess sources of contamination
- Understand the uncertainties associated with various forensic techniques
- Assess methods of site remediation, such as bioremediation versus pump and treat
- Incorporate forensic geochemical techniques with those of contaminant hydrogeology to better understand associated risk factors and apportion liability among responsible parties

Prerequisites: Completion of some college-level chemistry/geochemistry or completion of NWETC's Contaminant Chemistry and Transport (CHEM-403B) workshop.

Education Level: Intermediate

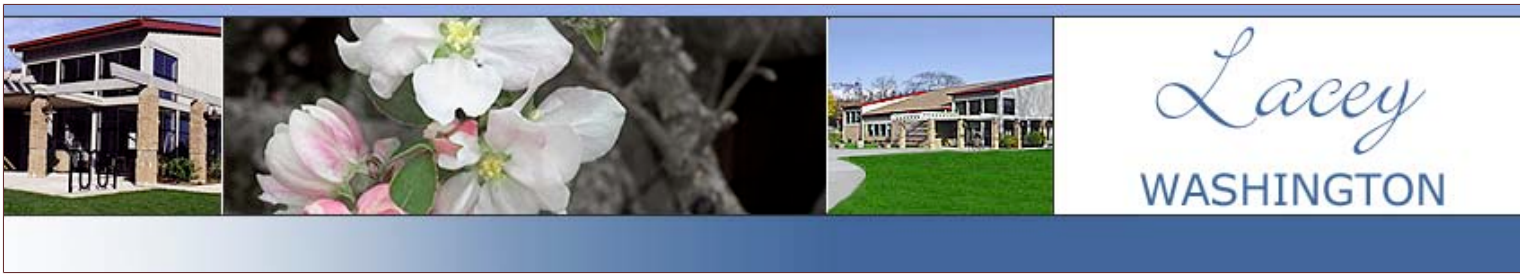
Course Materials: Each participant will receive a copy of the course proceedings including notes and reference material.

What to Bring: Calculator, coffee mug, and water bottle to reduce waste. Please wear comfortable clothes and shoes for class and walking to lunch. Snacks and beverages will be provided each day.

Continuing Education Units: 1.3

Registration: ***$495*** *(***$395** reduced tuition is available for Native American tribes; government employees; nonprofits; students; and NAEP, NEBC, NWAEP members). You may register via the link below or by calling the Northwest Environmental Training Center at 206-762-1976.*

Northwest Environmental Training Center
A nonprofit 501(c)(3) program of the Northwest Environmental Education Council
650 S. Orcas Street, Suite 220 | Seattle, Washington 98108
Phone: (206)762-1976 | Fax: (206)762-1979
www.nwetc.org



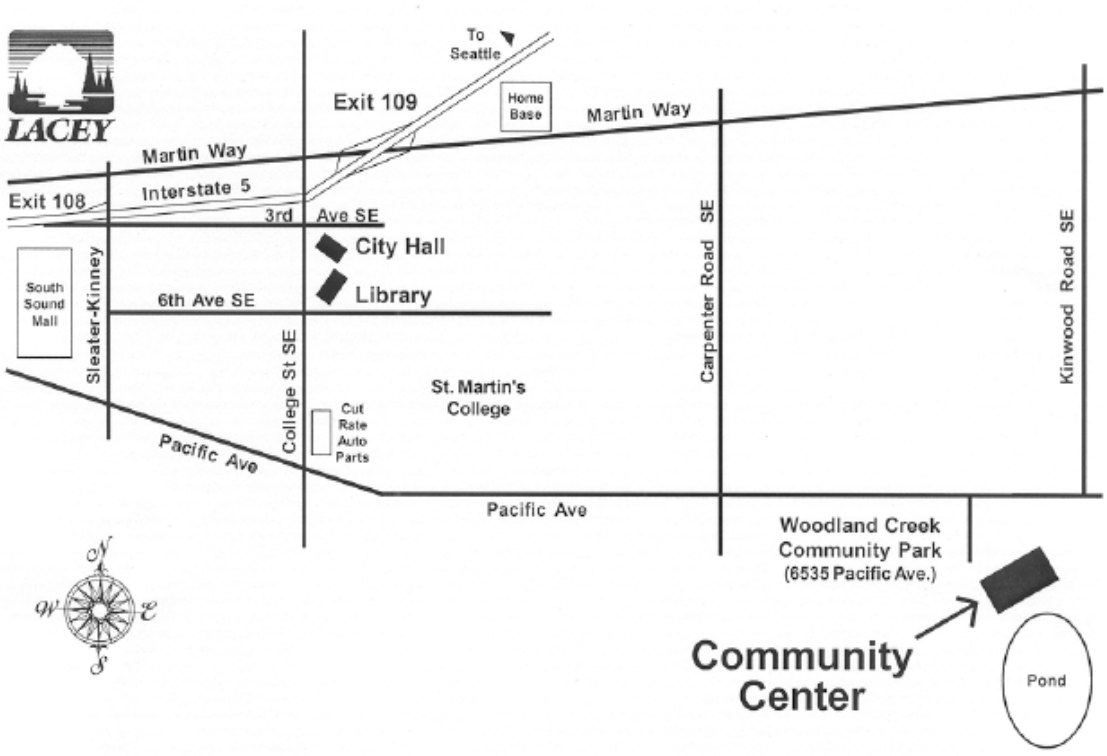
Lacey Community Center

Located in the Woodland Creek Community Park

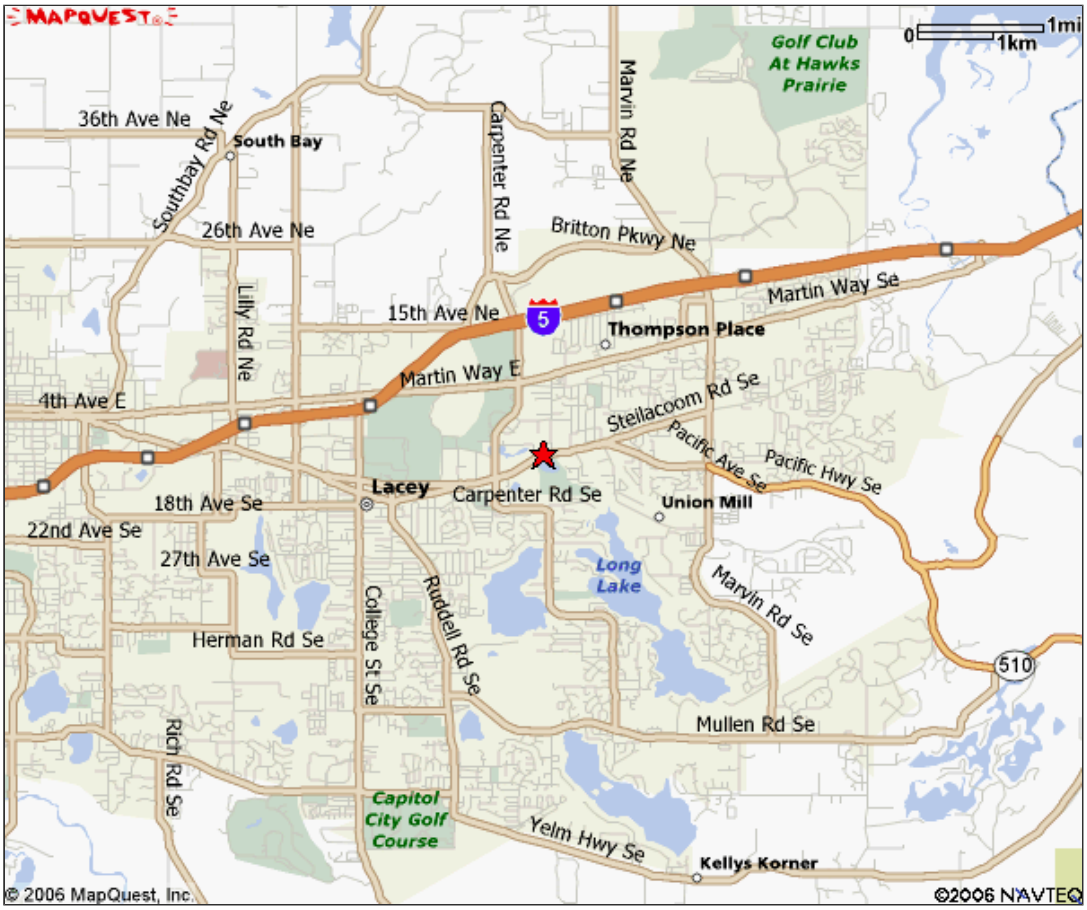
6729 Pacific Ave SE
Lacey, Washington 98503
360.491.0857

From I-5:

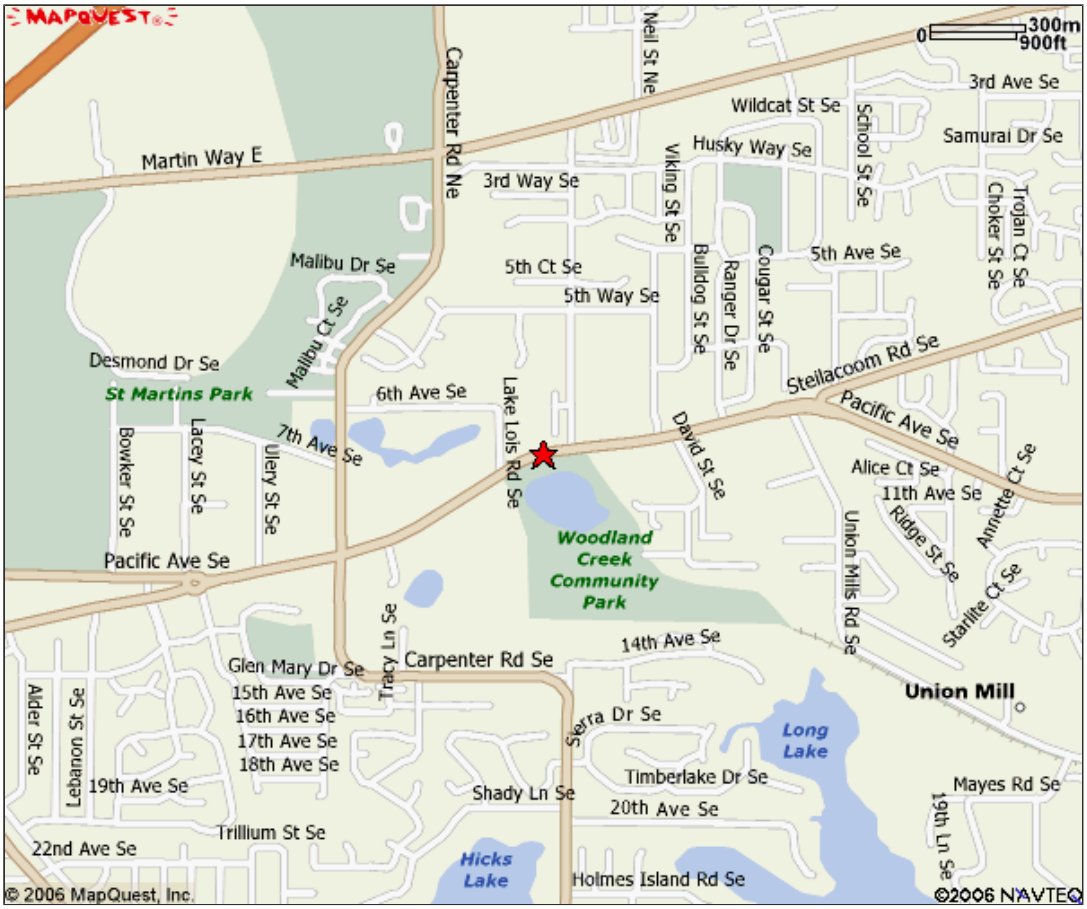
Take Exit 109 to Martin Way
Go east on Martin Way one mile to Carpenter Road
Turn right on Carpenter Road
Proceed one mile to Pacific Avenue
Turn left at Pacific Avenue
Proceed 0.3 mi to the Woodland Creek Community Park



REGIONAL MAP:

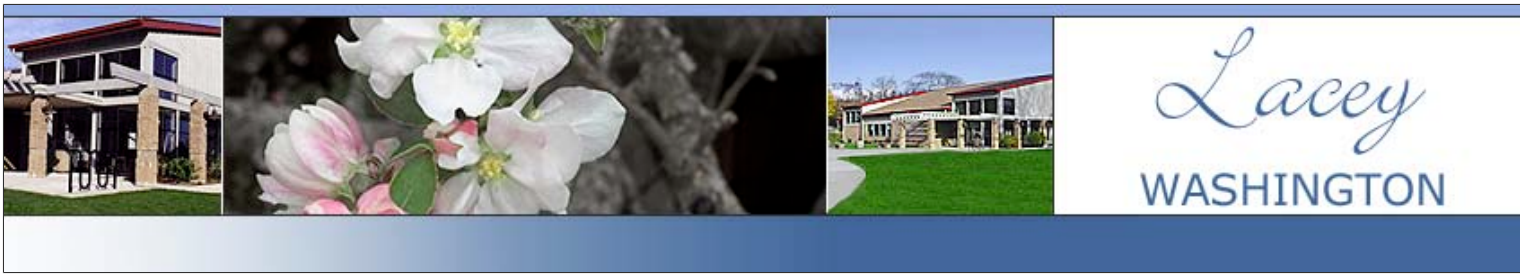


CITY MAP:



STREET MAP:

Northwest Environmental Training Center
A nonprofit 501(c)(3) program of the Northwest Environmental Education Council
650 S. Orcas Street, Suite 220 | Seattle, Washington 98108
Phone: (206)762-1976 | Fax: (206)762-1979
www.nwetc.org



Lacey Community Center

Located in the Woodland Creek Community Park

6729 Pacific Ave SE
Lacey, Washington 98503
360.491.0857

Nearby Hotels:

Quality Inn & Suites 120 College Street SE Lacey, WA	(360) 493-1991	**Red Lion Hotel - Olympia** 2300 Evergreen Park Dr SW Olympia, WA	(360) 943-4000
Lighthouse Bungalow 1215 E Bay Dr NE Olympia, WA	(360) 754-0389	**Comfort Inn of Lacey** 4700 Park Center Ave NE Lacey, WA	(360) 456-6300
Ameritel Inn - Olympia 4520 Martin Way E Olympia, WA	(360) 459-8866	**Quality Inn** 1211 Quince Street SE Olympia, WA	(360) 943-4710
Phoenix Inn Suites - Olympia 415 Capitol Way N Olympia, WA	(360) 570-0555	**Super 8 Motel** 112 College Street SE Lacey, WA	(360) 459-8888

Northwest Environmental Training Center
A nonprofit 501(c)(3) program of the Northwest Environmental Education Council
650 S. Orcas Street, Suite 220 | Seattle, Washington 98108
Phone: (206)762-1976 | Fax: (206)762-1979
www.nwetc.org

650 S Orcas Street, Suite 220, Seattle, Washington 98108
Ph: (206)762-1976, Fax: (206)762-1979
www.nwetc.org

REGISTRATION FORM

Name:_____ **Today's Date:** _____

Agency/Organization:_____

Street Address:_____

Street Address (cont'd):_____

City:_____ **State:**_____ **Zip:**_____

Phone:_____ **Fax:**_____

Email:_____ **Title:**_____

Contaminant Forensics **$**_____

Course ID: CHEM-405, August 12-13, 2008
Lacey Community Center
Woodland Creek Community Park, Lacey, WA
Registration: $495 ($395*)

*Reduced rates for Native American Tribes; nonprofits; government; students; and NEBC, NAEP, NWAEP members.

Payment Method: Check ☐ PO ☐ Credit Card (Visa/Mastercard) ☐ Total: $_____

Credit Card or PO #:_____ **Exp:**_____

Notes: Please make checks payable to Northwest Environmental Training Center.

Cancellation Policy: Registration fees are fully refundable up to 30 days prior to the event and 50 percent refundable (or 100% credit) thereafter up to 3 business days prior to the event. No refunds are issued for cancellations occurring less than 3 business days before the start day.